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# 'Taking a Line for a Walk':

Expanding Architectural Concepts of the Line – Preliminary Course

experiments at the Bauhaus

This thesis is submitted to the University of London in partial fulfilment for the degree of Ph.D. in Architecture

By

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**ABSTRACT**

This thesis looks at expanded concepts of the line in architectural theory and interdisciplinary practice. Part I: Lines of Architecture consists of five theory-led chapters. In chapter one I explore how the line located is 'outside of architecture' (Ingraham), as a disciplinary boundary between art and architecture (Wigley), as a projection between concept, drawing and building (Evans), and positioned between the material and immaterial (Benjamin). These theories suggest that the line is a temporal and spatial condition, an exploration enriched by studies of the philosophical positions that consider lines in terms of 'becoming' (Grosz, Deleuze).

While chapter one explores Paul Klee's theme, 'Taking a line for a walk', through theories which expand concepts of the line, chapters two to five examine in more detail the work of Paul Klee and another 1920's Bauhaus Preliminary Course teacher, Laszlo Moholy-Nagy. In chapter two, the line is examined as a tool for mediation in formation processes and a volatile agent that acquires a variety of properties, according to Klee's terms, 'active', 'middle', or 'passive'. Chapter three discusses Klee's exploration of the line's materiality through its active function, temporal rhythm and the third dimension. Chapter four is concerned with Moholy-Nagy's understanding of the line's immateriality; in his view architecture is defined in terms of spatial relationships and here the line acquires virtual, anticipatory and ambiguous properties. In chapter five, Moholy-Nagy's generative drawing for theatre production and the line's role in his filmic projections take the line from the two-dimensional surface into a three-dimensional context analyzing the background of the line, as well as the line in a diagram and in film.

If architecture is taken to be a form of spatial practice (Rendell) it is possible to consider it the location of interdisciplinary practice. Part II: Lines out of Architecture is constructed in parallel to Part I and comprises five projects, each of which demonstrate a practice-led approach to researching new ways of practicing the line in architecture. Taken together the chapters and the projects argue that the line plays a key role in interdisciplinary forms of practising space and that this occurs when a line is taken for a walk outside the architectural drawing. The theory-led and practice-led research work are in conversation with one another exploring the same themes through different research methods, in this way, the thesis performs a 'conversational walk'.

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A Ph.D. thesis is a journey on which one often feels lost. Being lost can be exciting but it can also be a little frightening. In either case, my supervisor Jane Rendell was able to make the best out of my situation. Not only did she know how to challenge me and where to direct me, she had the endurance and patience to go through numerous drafts with an admirable precision. Without her guidance, commitment and support this thesis would not have been possible.

I am also grateful to my second supervisor Jonathan Hill who played an important role in helping me focus my research. His advice to relate my research to the Bauhaus Preliminary Course proved to be very useful.

I am particularly grateful to my colleague and friend Brian Hatton who observed very early on that my interest in teaching design had similarities with Paul Klee's teaching and advised me to look at Klee's teaching diagrams.

Many friends helped this thesis come about. Marko Kratohvil taught me art techniques and helped make my first project 'Walking Feeling'. Dirk Anderson helped me with computer animation. Christos Patakos helped me with the drawings for the winning entry to the UCL Graduation Ceremony. Dr Djordje Brujic introduced me to the programming techniques that were used for the project 'Epigrammatic conversation with Klee on line-endings – a garden project'. Christina Moudara and Leisa Clemente cheerfully assisted with the technical production of the thesis. Among many others I would like to single out Ivana Lukovic and John Andrews for making my life pleasurable at times of crisis. Above all those who offered emotional support throughout the thesis were my parents, who have always supported my on-going continuing education.

The Arts and Humanities Research Council made it possible with the award of Ph.D. studentship, and the Bartlett School of Architecture and University of Brighton generously supported my visit to the Bauhaus archive.

However, there are two people without whom I think the thesis would have been a very lonely journey. My daughter Leah demonstrated an excellent editorial eye for the definite article, a device the English have invented to tease those whose first language manages without it. To his surprise, my husband Duncan developed a genuine interest in my thesis and supported me both emotionally and intellectually. During our long critical discussions, and in spite of our common recognition that there are irreconcilable differences between the natures of argument in the sciences and the arts, we found a way to develop a common language that helped me generate new ideas and defend my position with a greater passion and better arguments. Because of that I devote this thesis to him.

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## INTRODUCTION

To write a thesis on the line is not an unusual architectural desire. The line, a constitutive element of any architectural drawing, is the most common tool with which architects describe their designs. However, my aim has not been to look at the line as a commonly understood architectural tool for representation. Rather, I have been searching for a line through which architectural representations may be re-thought, reconsidered and reworked in the light of practices that lie outside the commonly understood boundary of architecture. This research project aims then to extend architectural conceptions of the line by moving across the disciplinary boundaries of art and architecture as well as through innovative creative techniques. I believe that research along these 'lines' can extend architectural boundaries and allow for architecture further creative possibilities.

For a time in my design and academic practice I was interested in the way in which works of art allude to, and are an inspiration for, new visual and intellectual connections beyond the work itself. Such connections, for me, provided a trajectory of new ideas. Either in concept, technique or narrative, works of art spoke to me beyond their discipline. In time, I realized that I was unable to look at works of art impartially. I was always prejudiced. Architecturally prejudiced.

Architecture, for me, goes beyond the building and this is epitomized in the well-known words of Laszlo Moholy-Nagy: 'space creation is not primarily a question of the building material'.[1] In my opinion, architecture is a volatile discipline that is about thinking, creating, negotiating and demonstrating new spatial relationships. Architecture, in the process of finding new spatial relationships, cannot sit still within the boundaries of its own discipline but continuously engages with the conditions that lie outside of it. In particular, I believe that there is a dialogue between art and architecture from which trajectories of thought on spatial relationships can be explored. For me, works of art are a rich inspiration and conduit for many trajectories that lead towards architecture.

Among teachers, academics and even the general public it is commonly understood that 'architects draw' – these are the most typical words with which many would describe the role of the architect in the creation of architectural representations. However, for me, such a simple statement encompasses everything that is complex about architecture. In particular, I find that it is not the drawing, but its most prominent tool – the line – that is the most volatile location for the convergence of complexities pertinent to architecture. In order to discover just some of these complexities intrinsic to architecture I have focused my research on the line and creative processes associated with making lines.

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[1] Laszlo Moholy-Nagy, *The New Vision*, (New York: George Wittenborn, Inc., fourth revised edition, 1947), p. 62.

Understanding lines and drawings in architecture has been seen as an intellectual act. For examples we have, 'Conceptually, architecture begins with the *lineamenta*, the outline of architectural project in mind', the words of Joseph Rykwert in the glossary to Alberti's text *On the Art of Building in Ten Books*, where '*lineamenta* has been translated variously as *disegni* (Bartoli), meaning drawings and designs; *Risse* (Theuer); "form" (Panofsky, *Idea*); and by Krautheimer as "definitions", "plan", and "schematic outlines"...We have translated it therefore as "lineaments", which encompasses "lines", "linear characteristics", and so by implication, design' [2] and in addition the 'act of conceptualizing a building'.[3] The 'drawing of lines' and the 'drawing forth of ideas' (translated in Italian as *disegno*) have been seen as the principal role of architectural design.[4] Hill discusses how these ideas concerning *disegno* can be located in the history of the formation and teaching of art academies and their dissociation from manual workshops.[5]

In the sixteenth century, when the first design academies were formed, various artists' 'clubs' existed in parallel. Carl Goldstein discusses how Cellini and Vasari wrote about the regular meetings of such clubs and mentions that they involved the participation of many artists. Goldstein writes quoting Vasari that 'one, in the workshop of Baccio d'Agnolo, sponsored "marvellous lectures and debates" [...] with participation of such artists as Granacci, Raphael, Sansovino, Antonio and Giuliano da Sangallo and, at times, Michelangelo, Giovanni Francesco Rustici also was a host, according to Vasari, to a club [...] that organized festivities attended by painters, sculptors, musicians, and members of the Florentine upper classes'.[6] However, although such clubs used a workshop as their meeting place, the 'preoccupations of these clubs were altogether different from those of workshops: literature, poetry, and music rather than drawing, painting and sculpture'.[7] In contrast with such clubs, the workshop 'was organized around a whole range of strictly manual and technical procedures, from the grinding of pigments and preparation of panels to the practice of drawing, the skill basic to visual representation, whether in painting, sculpture, or architecture, taught alike to students preparing for careers in any of the three disciplines'.[8]

Goldstein discusses how in the first design school founded by Vasari in 1563, the *Academia del Disegno* in Florence, drawing and geometry were taught. Goldstein suggests that according to Vasari '*Disegno* is an apparent expression and declaration of the *concetto* [or judgement] that is held in the mind and of that which to say the same thing, has been imagined

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[2] Ingraham, *Architecture*, pp. 58, 168.
[3] Ingraham, *Architecture*, p. 59.
[4] Jonathan Hill, Design Research Seminar, The Bartlett UCL, London, November 2004.
[5] Jonathan Hill, Design Research Seminar, The Bartlett UCL, London, November 2004.
[6] Carl Goldstein, *Teaching Art: Academies and Schools from Vasari to Albers*, (Cambridge, Melbourne: Cambridge University Press, 1996), pp. 10 -11.
[7] Goldstein, *Teaching Art: Academies and Schools*, p. 11.
[8] Goldstein, *Teaching Art: Academies and Schools*, p. 11.

in the intellect and fabricated in the *idea*'.[9] In other words, for Goldstein, following Vasari,' *disegno*, is an ineluctably intellectualizing activity far different from, and not to be confused with, descriptive drawing'.[10] The *Academia del Disegno,* according to Goldstein, 'was a center of humanist learning, *disegno* a shorthand alluding to intellectual, not manual, activity' and for Goldstein its aim was 'to distance itself from the guilds of workmanship tradition' at the same time 'proclaiming its high intellectual purpose'.[11]

From my own architectural background, design and teaching practice I am familiar with looking at representations, but I am most interested in drawings that best described things that are beyond what is possible to represent. In addition, the drawing, for me, is both an intellectual and manual activity. The technique with which I choose to do a drawing has a direct impact on the space that I am trying to potentialize. I have often looked at art practices for inspiration to locate a different way of drawing and a different way of thinking about architecture.

I started my research for this thesis by looking at various contemporary art and architecture practices. Inspired by the assumption that the line is a place where a variety of properties such as mobility, tactility and immateriality intersect I searched through different works of art and architecture to discover various ways of creating lines. In my initial observations I found that my understanding of the line depended on discovering how different practices dealt with the process of making lines. To start with I would like to mention only some of the many practices that inspired my focus on the line.

For architect Daniel Libeskind, architecture is 'accomplished through a technique such as drawing wherein an exiled line falls to the ground. Two parallel lines signify a wall: precisely the wall, which is between the lines and is not a line'.[12] The lines produced by the ink spilled from the mobile installation projects by the artist Rebecca Horn are the lines of implied relationships that left marks on the wall of the gallery. In the work of Douglas Gordon I looked at the lines of the text marking the gallery wall which were the lines of absent words that were once spoken, while in Bill Viola's slow-motion videos that amplified the stillness of medieval paintings I found the unspoken lines of the actors. In Yves Klein's work I found the lines of architecture to be in the air and in Pipilotti Rist's video project I discovered directional lines that suggested the position of the viewer on the sofa. Finally, in Situationists' drawings I saw that lines could always be between action and knowledge, never in stasis, and always on the move. These lines [13], for me, suggested trajectories of thought and inspiration in terms of line's relationship to materiality, immateriality and projection.

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[9] Vasari's words quoted in Goldstein, *Teaching Art: Academies and Schools*, p. 14.
[10] Goldstein, *Teaching Art: Academies and Schools*, p. 14.
[11] Goldstein, *Teaching Art: Academies and Schools*, p. 17.
[12] Daniel Libeskind, 'Between the Lines', *The Space of Encounter*, (London: Thames and Hudson, 2001), pp. 23-30.
[13] All of these works I have seen in various exhibitions. However, for evidence of these works in published form see bibliography sources with artists' names.

Finding lines in all these locations I realized that there was a 'call' to extend and broaden the conceptualization of the line in architecture and the application of the line beyond the traditionally understood architectural drawing. The line, for me, became the active site of architectural investigation beyond its representational qualities. I realized that a line could be seen as the expression of a practice that rethinks architecture and architectural representation. I also realized that a line could be located outside paper and lie in film and video, animation, music and other practices. These un-drawn lines may be performed or practised, and suggest another understanding of the architectural line.

Primarily concerned with the creative process and equipped with the idea that the line could be drawn, performed, practised, imagined, material and immaterial, I embarked on a search for places in which all these properties of a line could be found. This place needed to be a location where there was negotiation between practice and theory, art and architecture, and immaterial idea and material execution.

To find places in which the line is analyzed and executed in such a way, I first turned to historical accounts of teaching in art academies to see if I could find the origin of a challenge to the notion of *disegno* as an intellectual activity. Carl Goldstein's *Teaching Art Academies and Schools from Vasari to Albers* provided me with an excellent overview using numerous original sources that were concerned with the history of teaching art. I have no intention of summarizing the main tenets of teaching art here. This would be an enormous task given the various positions and wide variety of sources. Since this thesis is not concerned with historiography of teaching art or a history of Bauhaus I give a highly selected reading of Goldstein's views as a way of introduction to creative teaching by Paul Klee and Laszlo Moholy-Nagy in the Preliminary Course at the Bauhaus and whose work I have researched through original sources in the Bauhaus archive as well as numerous items of secondary literature and translations of books published about them and the Bauhaus. My particular focus on the Bauhaus teaching of these two artists was in response to my critique of design as a purely intellectual activity –Bauhaus teaching was also concerned with materiality. In particular, the Preliminary Course, which both Klee and Moholy-Nagy taught, was the start of architectural education for any Bauhaus student and took a significantly different approach to art and design teaching if we compare it to the previous teaching of art and design in the academy.

The challenge to the approach of *disegno* as an intellectual activity embedded in the teaching approach of art academies has taken various forms over the history of the academic teaching of the arts. For example, according to Goldstein 'the justification for the reorganization of the Vienna academy in 1725 [...] and for the Dresden academy in 1763' can be considered in

terms of the argument that 'art [...] can be looked at from a commercial point of view'.[14] Although for Goldstein 'the division of responsibility between designer and artisan within manufacture was consistent with the academy's expressed contempt for materiality, it was animated at the same time by the unspoken appreciation of the beauty of fine handwork and a respect for skilled workers'.[15] However, Goldstein suggests that 'this indulgence in beautifully crafted objects was thwarted [...] when handiwork was displaced [...] by the single most decisive intervention of the modern world`: the machine'.[16]

Once objects were mass-produced by machine, John Ruskin's moral views on 'high' and 'low' art and the inferiority of machine-made copies as opposed to hand-made 'emotional' and 'truthful' objects, and William Morris's views on materials, although powerful, had opposition from industry and academies. In Goldstein's view, industry refused 'to concede the aesthetic inferiority of factory-made wares', while the academy was 'committed as always to "drawing" as an essentially intellectual activity that it would not allow to be contaminated by traces of the hand'.[17] However, according to Pevsner, 'the first major changes in design education seem to be traceable to Morris's influence', and, due to Morris, ' a revival of handicraft and industrial art took place in Europe'[18]. Goldstein suggests that there is strong historical evidence that the influence of Morris's approach 'played a major role in the Bauhaus's bringing together of artists and artisans'[19].

The Bauhaus was formed in 1919 when Walter Gropius reorganized and united two Weimar institutions, the Academy of Fine Arts and the School of Applied Arts. An interesting point the name is that in German '*Bau*, though literally meaning "building", echoed the term for the medieval guilds of masons, builders, and decorators, the *Bauhutten*, which the Bauhaus evidently was meant to recall'.[20] The importance of Bauhaus for Goldstein in terms of education seems to be twofold: 'the creation of a federation of the visual arts under the aegis of architecture and [...] the merger of art and craft'.[21]

Goldstein considers how the introduction of the much-famed 'Preliminary Course', first run by Johannes Itten, 'was supposed to remove the barrier separating art from craft'.[22] Although there was a change in direction for the Bauhaus in the statement by Gropius in 1923 'for adjustment of craftsmanship in recognition of mechanized production, an appeal for the union of art and technology'[23] and giving leadership of Preliminary Course to Laszlo Moholy-Nagy, 'Bauhaus's championship of the materiality that the academy had repressed made an

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[14] N. Pevsner words from *Academies of Art Past and Present*, Cambridge 1940. Reprinted New York, 1973, quoted in Carl Goldstein *Teaching Art: Academies and Schools from Vasari to Albers*, (Cambridge, Melbourne: Cambridge University Press, 1996), p. 253.
[15] Goldstein *Teaching Art: Academies and Schools*, p. 254.
[16] Goldstein *Teaching Art: Academies and Schools*, p. 255.
[17] Goldstein *Teaching Art: Academies and Schools*, p. 258.
[18] Goldstein *Teaching Art: Academies and Schools*, p. 260.
[19] Goldstein *Teaching Art: Academies and Schools*, p. 261.
[20] Goldstein *Teaching Art: Academies and Schools*, p. 261.
[21] Goldstein *Teaching Art: Academies and Schools*, p. 261.
[22] Goldstein *Teaching Art: Academies and Schools*, p. 262.
[23] Goldstein *Teaching Art: Academies and Schools*, p. 265.

enduring mark on the teaching of art'.[24] In particular, the focus of the teaching was on an understanding of the property of materials, the history of art in terms of methods and techniques, the deployment of new technology, in particular photography, and also the teaching of 'geometrical abstraction' which is also a 'formalist' mode according to Goldstein 'tracing its origins specifically to development of art - not the crafts' and nourishing an understanding of architecture as all-encompassing of the whole of arts.[25] Also, to add to the contradictions of the Bauhaus, was the teaching of architecture. In the words of Bauhaus teacher Oskar Schlemmer: '"the construction and architecture class or workshop, which should be the core of the Bauhaus, does not exist officially, but only in Gropius' private office...It is an architectural bureau, its aims directly opposed to the schooling of the workshops"[...]"if only the Bauhaus would admit to being a modern art school"'.[26]

The particularity of the Bauhaus approach of teaching was best exemplified through the Preliminary Course in which the students from the beginning had to take a different approach to the creative process than the one currently being taught at the academy. When Josef Albers enrolled in the course, he commented: 'after destroying most of my academic studies, [...] I began over again in Weimar, beginning with the 'Preparatory Course'.[27] It is important to note that the 'Preparatory' or 'Preliminary' or 'Basic' Course, named differently in various sources [28], was not a monolithic teaching structure from the beginning until the end of the Bauhaus.[29] Like everything else at the Bauhaus, individual teachers significantly influenced the teaching. The course under Johannes Itten was quite different to that under Laszlo Moholy-Nagy or Josef Albers. However, the biggest educational shift (particularly in the second phase of Bauhaus which coincided with the expansion of the Preliminary Course from six months into a year) marked the beginning of a new chapter in Bauhaus history.[30] A new intellectual was created by the introduction of working with materials, an approach in which students were made aware of machine mass-production, and where the school provided a laboratory for prototypes to be mass-produced in industry. Also, in terms of the introduction of new technology like the camera, the division between the traditional means of producing drawings, paintings and objects, and the utilization of new means of production was most evident during the second phase of Bauhaus. The second phase is broadly associated with a change in the manifesto from 'arts and crafts new unity' to 'art and industry new unity' as announced in the words of Walter Gropius.[31] It was also significant in terms of the Bauhaus' move from Weimar to Dessau into a newly designed building by Gropius. Finally the particularity of teaching in the second phase

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[24] Goldstein *Teaching Art: Academies and Schools*, p. 264.
[25] Goldstein *Teaching Art: Academies and Schools*, pp. 262-5.
[26] Requoted from Whitford F. *Bauhaus*, (London: 1986, 78). See Goldstein, *Teaching Art: Academies and Schools*, pp. 263-4.
[27] Requoted from *Black Mountain College Papers* (North Carolina Department of Archives and History, Raleigh, N.C., 2:25). Goldstein *Teaching Art Academies and Schools*, p. 263.
[28] For various names of Preliminary Course see Hans M. Wingler, *The Bauhaus*, (Cambridge Massachusetts; London, England: The MIT Press, 1975), Magdalena Droste, *Bauhaus 1919-1933*, BAUHAUS Archive, Benedikt Tachen Verlag GmbH, 1993), Rainer K. Wick, *Teaching at the Bauhaus*, (Ostfildern-Ruit : Hatje Cantz, 2000).
[29] Wick, *Teaching at the Bauhaus*.
[30] Droste, *Bauhaus, 1919-1933*.
[31] Hans M. Wingler, *The Bauhaus*, (Cambridge, Massachusetts; London, England: The MIT Press, 1975).

was also evident in the appointment of Laszlo Moholy-Nagy in 1924 to lead the 'Preliminary Course'.

The difference between Paul Klee, who taught the course 'Theory of Form' (both under Itten and Moholy-Nagy) in the 'Preliminary Course', and Laszlo Moholy-Nagy's experiments in new media like photography and film are particularly useful examples for understanding educational strategies at a time of technological change. A new machine – the camera – opened up possibilities that the existing techniques of painting could not provide. However, the apparent opposition between these different teaching methods resides in the dichotomy between hand and machine, or between the hand-reproduced line, which produces materiality of a kind, and the photographically-produced image which can be seen as immaterial, capturing light, while producing lines on paper.

I have focused my research on the innovative work of Laszlo Moholy-Nagy and his projects with the photogram, photograph, photoplastic, film and theatre, and Paul Klee's work on the active, middle, passive and mediating line, in terms of dimension, progression, and rhythm in order to locate places in which a line can describe architecture beyond representation. Their work offers a variety of different techniques and conceptual tools through which architecture can be described. While Klee was obsessed with the material line made with pigment, Moholy-Nagy was fascinated with the immaterial and the line captured by light. While neither was an architect, Klee and Moholy-Nagy enacted their personal work and educational practices at the Bauhaus through a variety of techniques and artistic expressions that extended the boundaries of the commonly understood drawn line. For Klee, 'taking a line for a walk' meant practising lines while thinking abstractly. For Moholy-Nagy the practice of lines happened by capturing light, through projection or even through a telephone communication. In relation to their practice and their writing I embarked on an exploration of ideas concerning action and movement, immateriality and projection, all properties of architecture that, for me, were located in the line.

A number of questions immediately started to emerge that are pertinent to the materiality-immateriality, hand-machine, intellectual-manual dichotomies. One that comes immediately to mind is what happens if the line in an architectural drawing takes a path beyond the drawing board? Another asks what happens if we consider the line as a place of convergence for many practices?

My research into Klee and Moholy-Nagy's work made me realize that there is a need to re-think the way we draw lines in architecture. I started, following Klee's metaphor, to 'take the line for a walk' across a number of diverging practices. In my 'walk' through the creative work of Klee and Moholy-Nagy I realized that, either explicitly or implicitly, discussing or practising the line, both Klee and Moholy-Nagy produced trajectories through which their lines may lead art to architecture. Both Klee and Moholy-Nagy were concerned with the process by which lines were

created, rather then conceptualizing ideas about the line in advance. Both were concerned with mediums and techniques of the enactments of lines. Such enactments seemed to embed the optical and tactile intuitions into the line, Klee through the inseparability of the body and the line, and for Moholy-Nagy the body was absent in the presence of the line. The creative practice and theoretical writings of Klee and Moholy-Nagy went hand-in-hand with their practices.

As well as researching the work of Klee and Moholy-Nagy I realized that the line is a place of many complex conceptual relationships, and to resolve some of them I turned to architectural theory. The complexities pertinent to my own research on the line have been studied in the past by key thinkers of architectural theory, and the recent debate on architectural representation has brought back drawing and design as a topic of academic discussion.

The recent conference entitled *Critical Architecture* held at the Bartlett School of Architecture in 2005, and in the selection of papers published from the conference in *The Journal of Architecture* the same year, addressed in various ways what we may understand to be critical in respect to architectural representation. I would like to focus on three particular papers that, in my opinion, addressed how architectural representation can be extended beyond the commonly understood architectural drawing. I found these approaches to be both inspirational and allied to some aspects of my own thinking.

Jane Rendell's paper 'Architecture – Writing' addressed the notion of site-writing particularly influenced by art-writing. Rendell demonstrated how the 'spatial possibilities' of four of her texts on her art-writing and criticism could have implications for architectural criticism through what she calls a 'hybrid term architecture-writing' which she suggests 'demands us to rethink objects, subjects, sites, methods and materials of architectural criticism'.[32] Rendell states that in order to achieve such a re-thinking we should be looking at 'sites of interdisciplinary exchange'.[33] In particular, she suggests that 'the possibilities opened up for criticism by art- and site-writing engage closely with debates around the relationship between theory and critical practice in the visual and spatial arts'.[34] Rendell sees an engagement in interdisciplinary debate through 'travelling concepts' which, in her opinion, are 'indispensable, they allow us to challenge assumptions internal to disciplines and to rethink, in this instance, what architecture is, what it might be and how we might think, write and make buildings critically'.[35] For Rendell 'architecture-writing suggests that the objects and writers of architectural criticism may come from beyond architecture'.[36]

The idea that we could write architecture rather than draw it, that the sites of architecture may be multiple, that we should look at the 'interdisciplinary exchange' between art

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[32] Jane Rendell, 'Architecture-Writing', *The Journal of Architecture*, Volume 10, Number 3, pp. 255-64.
[33] Rendell, 'Architecture-Writing', p. 256.
[34] Rendell, 'Architecture-Writing', p. 261.
[35] Rendell, 'Architecture-Writing', p. 261.
[36] Rendell, 'Architecture-Writing', p. 261.

and architecture in order to further enrich architecture and that for such a way of thinking we may need to use 'travelling concepts', strongly inspired my own way of thinking about architectural representations and the potential sites of investigations in my own research. I was already working on ideas of mobility as a way of interconnecting various ideas coming from my own focus on the drawn line and its properties. In the process of thinking about travelling, mobility and interdisciplinary sites, I realized that I had to look closer at a place where these concepts can be further explored. Here, the natural place of convergence of all of these ideas emerged –the line between the material and immaterial.

Tim Anstey's paper 'The ambiguities of *disegno*' outlined a very interesting point in relation to his understanding of the role of an architect. Anstey suggested that the architect's primary tool should be understood in terms of 'drawing forth' and that embedded in the Italian origin of the word *disegno* is a particular ambiguity.[37] Anstey referred to Alberti's statement that 'it becomes clear that the architect does not "make" buildings; he makes representations of buildings'.[38] For Anstey, implicit in Alberti's text, *De re aedificatoria*, 'is the potential overlapping of the rhetoric with the use of visual representation, and it is in this development that *disegno* "the drawing" will, self evidently, find its place'.[39] *Disegno*, according to Anstey, also has origins in a Latin root, this time from *designare,* which denotes intention.[40] Anstey suggests that 'to separate design as "intention" from design as "projected building" appears to threaten a definition of the architect'.[41] Taking the example of Cedric Price's project *Fun Palace* published in *Works II* in 1984, Anstey suggests that 'Price suspends the distinction between the built and the unbuilt, blurring as much as possible boundaries between *disegno* as intention and *disegno* as the projection of built form'.[42]

The ambiguity of *disegno* that Anstey suggested related to my own thoughts concerning the ambiguities present in the line. My own research interest has been to pursue subjective intentions and projections in the drawing process, in which particular transfers occurred between ideas and drawings. This meant that I wished to consider the intentional process of creating lines rather than the finished drawing. Furthermore, in order to deal with the line I pursued a focus on the properties that lines acquire during such creative process. My focus on the action, function, rhythm and dimension of the line emphasises it as a carrier of design practice. During my research I also realized that this focus allowed for lines to possess an ambiguity similar to the one that Anstey outlined as the ambiguity of *disegno*.

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[37] Tim Anstey, 'The ambiguities of *disegno*', *The Journal of Architecture*, Volume 10, Number 3, pp. 295-306.
[38] Anstey, 'The ambiguities of *disegno*', p. 296.
[39] Anstey, 'The ambiguities of *disegno*', p. 297.
[40] Anstey, 'The ambiguities of *disegno*', p. 297.
[41] Anstey, 'The ambiguities of *disegno*', p. 303.
[42] Anstey, 'The ambiguities of *disegno*', p. 303.

Stephen Cairns's paper 'Design media: architecture and the grounds for invention' opened up the relation of media to design.[43] Cairns suggests that the 'gap [...] between the space of ideas – in the architect's head – and the material manifestation of those ideas – by the builder's hands' was 'institutionalised with the emergence of the studio as the space that facilitated the invention of architectural ideas'.[44] Cairns further argues that 'located from building site itself, protecting the clean surfaces of the drawing board within, the studio enabled and emblematised the intellectual, conceptual and exploratory work of *disegno*.[45] However, Cairns further elaborates his argument in relation to the specificity of the medium in architecture (drawing on paper) by referring to what Rosalind Krauss has called a '"post-medium" condition' where 'in specific forms of contemporary art practice, aesthetic and critical possibilities [...] emerge through a "reinvention of the medium"'.[46] Cairns states that 'reinvention occurs [...] through 'examining certain latent associational potentials that lie between media'.[47] For Cairns 'this position [...] offers architecture a range of unique possibilities that allow it to maintain its historic stake in the art project, while exploring its inherent worldly commitments'.[48]

Taking the example of Yukinori Yanagi's work entitled 'Asia-Pacific Ant Farm' (1994), Cairns examines the way in which ants, by their movement, slowly distorted an image painted in the sand (various national flags represented by coloured sand in Perspex boxes).[49] Cairns suggested that this art project not only questioned the role of the line and its support but also that the creation of these lines in the sand implied the transformation of the physical world and not just a record of thoughts.[50] Cairns sees this way of producing a line as allied to Nelson Goodman's '"allographic" mode of representation' which belongs, to architecture and music and which, according to Goodman, should be distinguished from '"autographic"' modes of representation such as painting and sculpture 'whose history of production leads back to the hand of the artist and which embody aesthetic expression within their medium in a singular way'.[51] Cairns states that 'art of architecture, by contrast, necessarily proliferates drawings as instructions intended to be implemented by a wide range of people – builders, engineers, plumbers, electricians, etc.'[52] Cairns further elaborates that 'architecture's medium [...] cannot solely reside in the drawing' and that 'architecture's medium implicates a drift from idea to material, from architect's head to builder's hand, from design studio to construction site'.[53] His example of the lines that Yanagi's ants make are 'a reminder of architecture's allographic mode of representation in which the paper and the site are assumed somehow to collapse into each

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[43] Stephen Cairns, 'Design media: architecture and the grounds for invention', *The Journal of Architecture*, Volume 10, Number 3, pp. 307-15.
[44] Cairns, 'Design media', p. 308.
[45] Cairns, 'Design media', p. 308.
[46] Cairns, quoting Rosalind Krauss from her essay '"... And then turn away?" An essay on James Coleman', *October*, 81 (1997), pp. 5-33, 'Design media', p. 309.
[47] Cairns, 'Design media', p. 309.
[48] Cairns, 'Design media', p. 309.
[49] Cairns, 'Design media', p. 310.
[50] Cairns, 'Design media', p. 310.
[51] Cairns, quoting Nelson Goodman, *Languages of Art: An Approach to a Theory of Symbols* (Indianapolis: Hackett, 1976), 'Design media', p. 310.
[52] Cairns, 'Design media', p. 311.
[53] Cairns, 'Design media', p. 311.

other'.[54] Furthermore, Cairn's own experiences in the city of Jakarta and his particular attempt to represent them through a specific, non-representational photographic technique for him aimed to find a mode of representation that would enrich what he calls allographic modes of representation that in his opinion sustain architectural design practices.[55]

In my own research and practice, I have been trying to find similar ways to go beyond traditional mediums for architecture. My desire, similar to Cairns, is to use unusual ways to create lines that are not necessarily bound to drawing on paper. Similar to Cairns I have been inspired with the idea of travelling between material and immaterial in architecture and I have tried to move the line off the drawing board into space both conceptually and through the use of particular technique, through material and immaterial practices and between actual and virtual modes of representation. Like Cairns, I have been more interested in how lines are made and what kind of trajectories they provide out of architecture than in what they represent. In fact, I realized that when a line that travels through various mediums and techniques it is, for me, at its most mobile, highly volatile and the most interesting site of different, inspiring spatial possibilities.

One further focus of my research has been my own practice. During my historical and theoretical research for this thesis I have in parallel been practising these various techniques and ideas on lines. Through parallel work in theory and practice I have defined a relationship in which both are considered equal in measure and scope. In defining my theory–practice relationship I was inspired by Jane Rendell's article 'between two' (2003) and her forthcoming book *Art and Architecture: A Place Between* (forthcoming, 2006).

Rendell describes how 'rather than understanding practice as an application or consequence of theory, or of positioning practice as the inspiration for theory, Deleuze suggests that these 'relationships appear more fragmentary and partial"'.[56] Rendell also emphasises processes in which movements between theoretical concepts and other domains, like that of practice, occur in Deleuze's discussion of "relays":

> *Practice is a set of relays from one theoretical point to another, and theory is a relay from one practice to another. No theory can develop without eventually encountering a wall, and practice is necessary for piercing this wall.*[57]

Rendell further emphasises how in Deleuze's view 'theory is like a box of tools' that "must be useful', and suggests that it is this 'proactive and inventive aspect to Deleuze's

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[54] Cairns, 'Design media', p. 311.
[55] Cairns, 'Design media', p. 313.
[56] Jane Rendell, quoting Deleuze from 'Intellectuals and Power: A conversation between Michel Foucault and Gilles Deleuze', *Language, Counter-memory, Practice; Selected Essays and Interviews*, (New York and Ithaca: Cornell University Press, 1977), pp. 205-17, 'between two', *The Journal of Architecture*, Volume 8, Summer 2003, p. 226.
[57] Rendell, quoting Deleuze from 'Intellectuals and Power', 'between two', *The Journal of Architecture*, p. 226.

thinking, his thinking about what theory can do, that lends itself most to practice'.[58] However, Rendell also suggests, particularly referring to conceptual art, that 'it is also possible to locate theoretical concerns in the work of certain kind of practitioners' and that this may produce a further complexifying of boundaries between theory and practice.[59] She further develops the argument by asking 'what is practice?' and 'what is theory?' and 'is theory, a discipline devoted to development of ideas, also an art practice regardless of the medium it adopts?'[60]

The idea of the 'theory–practice' relationship as a process of movement or relays which blur the boundaries between theory and practice inspired my own thinking concerning how I could define my own position in terms of both. Since I was more interested in the relationship between the two rather than the re-definition of either, I started thinking in what way I may be able to understand the complex, intuitive, conceptual, analytical and active relationship that happens between ideas and their materialization during the creative process. For me, this relationship reminded me of the qualities of a conversation, in which one may start with an idea but through conversation many new diverging and fragmentary trajectories may impinge on the original idea of the conversation, changing it, re-shaping it and re-working it through the way that the conversation develops.

In *Art and Architecture: A Place Between*, Rendell suggests that today there 'seems to be a fascination with walking among artists, as a way perhaps of engaging with place, space and site'.[61] Rendell seems to suggest three ways of look at walking: 'by relating one place or site to another in a particular sequence, walking provides a way of practising space through time and time through space'.[62] She also states that 'as a critical spatial practice, walking operates in [...] rethinking place as unfixed and site as performed'.[63] Finally, Rendell argues that 'as an activity, walking temporarily positions the subject in motion between a series of scenes that at times might resemble dialectical images; depending on the histories of a precise combination of objects at a particular location these could be constellations in which thinking stops or allegorical and/or montage compositions'.[64]

My own research has used the line as the place and site for re-thinking the design process both spatially and temporally. I have used the line to 'walk' myself through different creative processes and techniques. Conceptually I have extended architectural conceptions of the line by moving it through different theoretical investigations. Paul Klee's metaphor - 'taking a line for a walk' – has framed the thesis conceptually, materially and theoretically.

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[58] Rendell, quoting Deleuze from 'Intellectuals and Power', 'between two', *The Journal of Architecture*, p. 227.
[59] Rendell, 'between two', *The Journal of Architecture*, p. 227.
[60] Rendell, 'between two', *The Journal of Architecture*, p. 228.
[61] Jane Rendell, *Art and Architecture: A Place Between,* (forthcoming, 2006), p. 187.
[62] Rendell, *Art and Architecture*, p. 187.
[63] Rendell, *Art and Architecture*, p. 187.
[64] Rendell, *Art and Architecture*, p. 187-8.

The choice to study the creative practices of Paul Klee and Laszlo Moholy-Nagy was inspired by the reason that I see my role in research not to be a critic of an art or architecture but rather to be a creative archaeologist uncovering design strategies embedded in the work of creative practitioners who both practised and wrote about their work. Both Klee and Moholy-Nagy during their teaching in the Preliminary Course at the Bauhaus not only creatively experimented through their practice and teaching but also in parallel wrote a significant number of essays, books and papers. Some of their written material was published in one of the fourteen original editions of Bauhaus books, like *Pedagogical Sketchbook [Pedagogisches Skizzenbuch]* [65], by Klee, *Painting, Photography, Film, [Malerai, Fotografie, Film]* [66] and *The New Vision: From Material to Architecture [Von Material zu Architektur]* [67] by Moholy-Nagy. Klee was a prolific writer of pedagogical notes concerned with the 'Theory of Form' whose enormous opus is collated in nine volumes *of Paul Klee: catalogue raisonné* [68] and his pedagogical opus is posthumously published in two volumes of his notebooks: *The Thinking Eye* and *The Nature of Nature* [69]. Moholy-Nagy published numerous papers on his art in magazines of the time like *i 10*, *Die Form*, *Korunk*, *Munka*, *De Stijl* and *Der Sturm* most of which are published in translated version in the comprehensive oeuvre by Krisztina Passuth *Moholy-Nagy.*

The thesis is concerned with research that operates at the boundary between theory and practice. Through both theory and practice it aims to locate and analyze as well as suggest and produce new ways of practicing the line between art and architecture. In order to achieve this aim the research summarizes existing architectural theories on the line and extends them by further theorization through the work of Gilles Deleuze and Elizabeth Grosz on 'becoming', 'virtual', 'actual' and 'real'. This thesis locates new ways of practicing the line in a careful reading and analysis of Paul Klee and Laszlo Moholy-Nagy's creative practice and published texts. In parallel to this theoretical research, my own practice researches these new possibilities and properties of the line through five different experimental projects. This thesis is comprised then of two parallel parts. **Part I: Lines of Architecture** is driven by theory-led research and consists of five chapters, the first lays out a theoretical context for establishing new practices of the line in architecture, and the next four discuss the line in the work Klee and Moholy-Nagy in the light of this theorization. **Part II: Lines out of Architecture** demonstrates my practice-led research which explores new practices of the line, and which is conducted through five projects, each one developed in parallel to the research undertaken in Part I. Each project experiments

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[65] Paul Klee, *Pedagogical Sketchbook [Pedagogisches Skizzenbuch]*, Neue Bauhausbucher, Kathrin Hassold (trans.), (Berlin: Gebr. Mann Verlag, 1997).
[66] Laszlo Moholy-Nagy, *Painting, Photography, Film*, original published in 1925 in *Bauhausbucher 8* as *Malerai, Fotografie, Film*, (Cambridge, Massachusetts: The MIT Press, second printing, 1987).
[67] Laszlo Moholy-Nagy, *The New Vision and Abstract of an Artist*, [1928] (New York: George Wittenborn, fourth revised edition, 1947).
[68] Paul Klee, *Paul Klee: catalogue raisonné*, Paul Klee Foundation, Museum of Fine Arts, Berne, (ed.), (London: Thames and Hudson, 1998-2004).
[69] Paul Klee, *Paul Klee Notebooks, Volume 1, The Thinking Eye*, Jürg Spiller (ed.), Ralph Manheim (trans.), (London: Lund Humphries; New York: George Wittenborn, 1961) and *Paul Klee Notebooks, Volume 2, The Nature of Nature*, Jurg Spiller (ed.), Heinz Norden (trans.), (London: Lund Humphries, 1973).

with a particular theoretical interest in a property of the line investigated in one of the theoretical chapters.

This way of working between theory and practice demands the employment of a variety of research methods. One research method adopts a theoretical framing in order to critique the line as discussed in normative architectural representation. In this thesis, I have expanded the potential of the architectural understandings of the line by Ingraham, Evans, Wigley and Benjamin by considering them through Gilles Deleuze's and Elizabeth Grosz's theories of 'becoming', 'virtual', 'actual' and 'real'. A second method deployed in this thesis also uses theory to inform the knowledge gained through historical and archival inquiry. This occurs when a close reading of Paul Klee and Laszlo Moholy-Nagy's work is reconsidered through the philosophical speculations of Deleuze and Grosz. A third method adopted is an interdisciplinary one which works with theory and practice in parallel to one another in through what I call 'a conversation'. Each chapter on Klee or Moholy-Nagy work develops a particular theme out of a close reading of their work, one that is also common to the practice-led research conducted through my own projects, which run parallel to the theory-led research. In total then, there are four thematics explored in this methodological approach which together produce a new practice of the line: first the practice of 'mobile lines' in the project 'Walking Feeling'; second the practice of 'material lines' in the project 'Homely Rhythms'; third the practice of 'immaterial lines' in the project 'Line-Notes'; and finally the practice of 'projecting lines' in 'Line...Take Me for a Walk'. The development of these four practices culminates in a final project which combines a variety of these methods, described in terms of 'a conversational method of working' and exemplified in the final project 'An epigrammatic Conversation with Klee on Line-endings: a garden project'.

I will outline here in more detail the content of the thesis. **Part I: Lines of Architecture** consists of five chapters. **Chapter 1.0: Question Lines** discusses theoretical precedents on the line and proposes extensions of architectural conceptions of the line in the light of the philosophical writings of Gilles Deleuze and Elizabeth Grosz.

**Section 1.1: Lines Outside of Architecture**, discusses how architectural theorist has Catherine Ingraham has developed a theoretical strategy in her book *Architecture and the Burdens of Linearity* that is concerned with how to 'locate architecture in places that were outside self-defined boundaries'.[70] Ingraham's work outlines possibilities for how to open-up a discussion on the line in architecture within an interdisciplinary context.

Another rich source of inspiration for my research that came from architectural theory was Robin Evans' work in the posthumously published book *The Projective Cast: Architecture and its three Geometries* (1995). This structures **Section 1.2: De-centering Lines**. Evans located a particular relationship between geometrical drawings and the appearance of geometry

[70] Catherine Ingraham, *Architecture and the Burdens of Linearity*, (New Haven and London: Yale University Press, 1998), p. 4.

in architecture, which is a de-centred, and active. The activity of such a relationship occurs in an in-between space where connections between thinking, imagination, drawing and building happen through various 'guises of projection' or 'processes that we have chosen to model on projection'. These Evans calls 'zones of instability'.[71] Evans tries to depict this relationship in his diagram on the creative process of design in which he explains the complex relationship between observer, designed object, perspective and orthographic projection.

In **Section 1.3: Becoming Lines**, I discuss Andrew Benjamin's work on the line in which he proposes that the line should be looked at as the 'after effect of that which constructs it'.[72] Suggesting that 'lines are constructed' [73] and because of that more than one condition can always be brought to bear upon the line, Benjamin opens up a way of re-thinking the line through practice and technique. In particular, Benjamin's work on the diagram further elaborates the idea of the future in relation to a diagram stating that 'in the diagram, there is a possibility of realizing that which is yet to come'.[74]

In **Section 1.4: Boundary Lines**, I question the role of paper as the background for a drawing through the work of the architectural theoretician Mark Wigley. Wigley suggests that there is invisibility to paper, which makes it, appear to occupy 'a liminal space between material and immaterial' and which in turn 'allows it to act as a bridge across the classical divide between material and idea'.[75] Wigley's argument raises the role of the background of drawing and, also like Benjamin, states the importance of technique for drawings. In Wigley's opinion, architects tend to cross the boundaries of the architectural discipline by using 'unfamiliar subjects and techniques' but which in the end 'give way to the familiar'.[76]

In **Section 1.5: Opening Lines of Enquiry**, I use the philosophical ideas of Gilles Deleuze concerning becoming, multiplicity, virtual and actual, lines of flight and the diagram, and Elizabeth Grosz's ideas of subjectivity, corporality, time and duration, to extend the architectural conceptualizations of Ingraham's, Evans's, Benjamin's and Wigley's discussions on the line. I create a theoretical framework based on four main concepts on the line: mobility, materiality, immateriality and projection which I discuss in detail in the following chapters in relation to the creative process and theoretical writings of Paul Klee and Laszlo Moholy-Nagy.

I start my detailed investigation focusing on Paul Klee's creative work on the line in **Chapter 2.0: The Mobility of the Line**, in which I address the line's mobility in three main

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[71] Robin Evans, *The Projective Cast: Architecture and Its Three Geometries*, (Cambridge, Massachusetts; London, England: The MIT Press, 1995), p. xxxi.
[72] Andrew Benjamin, lecture series *From Splines to Lines*, Architectural Association, London, February 2005. The lecture series consisted of six lectures where line has been looked at from a particular position: *Philosophy's Line*, *Drawing a Line Freud and Unconscious*, *Framing Pictures-Walter Benjamin on the Line*, *Malevich and Abstracting Line*, *Diagrams*, *Image of Different Lines*. All the notes taken from this lecture series are taken by the author.
[73] Benjamin, *From Splines to Lines*, February 2005.
[74] Benjamin, *From Splines to Lines,* February 2005.
[75] Mark Wigley, 'Paper, Scissors, Blur', in *The Activist Drawing: retracing Situationist Architectures from Constant's New Babylon to beyond*, Catherine de Zegher and Mark Wigley (eds), (NewYork: The Drawing Center, Cambridge, Massachusetts; London: MIT Press, 2001), p. 29.
[76] Wigley, 'Paper, Scissors, Blur', p. 37.

sections. In **Section 2.1: Between Tactile and Visual Intuitions - Movement** I focus on Paul Klee's diagrams of creation discussing how the line moves between the hand and the eye using Gilles Deleuze's ideas of sensation and Elizabeth Grosz's ideas of corporality. In **Section 2.2: The Active, Middle and Passive Line** I focus the analysis of Klee's line in terms of Deleuze's concept of action and Grosz's concept of the volatile body. In the last **Section 2.3: The Mediating Line**, using Deleuze's ideas on becoming and Grosz's arguments on the mobile body, I focus my argument on the line in relation to Klee's ideas that regard the line as the mediator between two states of formation.

Having discussed the mobility of the line I then turn to the analysis of line's properties through further analysis of Paul Klee's creative practice. In **Chapter 3.0: The Materiality of the Line** I discuss three aspects of Klee's line concerned with materiality. In **Section 3.1: The Function of the Line,** using Deleuze's idea of line as action, I analyse Klee's notion of the function of the line in respect of natural and bodily structures. In **Section 3.2: The Rhythm of the Line** I look at Klee's work on the rhythmical nature of the line through Grosz's ideas of temporality and duration. In the final **Section 3.3: The Dimension of the Line** I discuss Klee's use of colour in relation to his concepts of weight and measure and theorize through Grosz's idea of body the relationship between the third dimension and the line.

Having discussed the mobility of the line and line's materiality in Paul Klee's work I move to analyse the work of Laszlo Moholy-Nagy in which I see different properties of the line. The **Chapter 4.0: The Immateriality of the Line** focuses on space creation through moving lines or what Moholy-Nagy calls an immaterial building material – light. In the first **Section 4.1: The Virtual Line** I discuss the line in Moholy-Nagy's photograms in terms of Grosz's ideas of real and virtual and Deleuze's idea of light as matter. In the second **Section 4.2: An Anticipatory Line** I analyse the line in Moholy-Nagy's 'faulty' photographs in terms of Grosz's ideas of subjectivity of the viewer and temporality through which the line seen through the photographs taken from above and below are to be seen as provoking a subjective way of seeing the world through an apparently objective means – the photograph. In the third **Section 4.3: The Ambiguous Line** I look at the line in photo-plastics through Deleuze's idea of trajectory in which the drawn line is seen to possess immaterial and associative properties.

In **Chapter 5.0: The Projection of the Line**, I focus on the properties of the line in the projected images of Laszlo Moholy-Nagy's work. In the first **Section 5.1: The Background of the Line** I discuss the role of the background as a support to particular types of line in relation to Deleuze's notion of image and light. In the second **Section 5.2: The Line in the Diagram** I discuss the indeterminate role of the line in terms of Deleuze's arguments concerning diagram and lines of flight. In the third **Section 5.3: The Line in Film** I focus on the way in which lines may be located in a projected image in relation to Deleuze's ideas of movement-image and time-image.

**Part II: Lines out of Architecture** is the second part of the thesis and presents my practice-led research in parallel to Part I. This portfolio consists of documentation of my own practice conducted in relation to the ideas and themes explored in the chapters of Part I. Each of the five projects responds to a specific theme raised in Part 1. **Project 1: 'Walking Feeling'** describes a performance project that negotiated ideas of visual and tactile in relation to the body and the mobility of the line. **Project 2: 'Homely Rhythms'** describes the materiality of the line in the details of a house project and its relationship to a body. **Project 3: 'Lines – Notes'** describes the creation of lines as a form of note-making which considers how concepts of immateriality can inform the drawing of lines. **Project 4: 'Line ... Take Me for a Walk'** describes a winning competition project, which fragmented the background of the line, and projecting a line from a drawing board into a space. The final **Project 5: 'An Epigrammatic Conversation with Klee on Line-endings: A Garden Project'** concludes by returning to the beginning of the research – taking a line from Klee's own diagrammatic sketches and diaries for a walk into an animated installation project as well as responding to the aims of an interdisciplinary way of working which I set out in the first chapter of Part I. **Question Lines** but researched here in Part II through my own practice. This final project focuses in particular on 'conversation' as a way of working with both theory and practice.

The **Conclusions** consist of three sections, which draw out the common themes of Parts I and II and comment on their different methodical approaches. In **Section 1: Trajectories of the Line** I summarize how the thesis extends architectural conceptions of the line. In **Section 2: Loosening the Diagram** I turn back to one of the ideas explored in Chapter 1 – Evans' diagram of the creative process – in order to demonstrate the changes to his diagram produced by my analysis and practice of the line. I particularly focus on the observer/creator in Evans's diagram and discuss how concepts of mobility, materiality, immateriality and the projection of the line may alter the diagram sufficiently so that concepts that lie outside architecture may become internal to architecture – becoming architecture's own support. In **Section 3: An Unfinished Conversation** I suggest how the research conducted in this thesis in terms of theory and practice may extend into the future.

## PART 1: THEORY-LED RESEARCH: LINES TO ARCHITECTURE

### 1.0: QUESTION LINES

> *Even during early periods of architectural practice, when modes of representation included full-scale drawings, templates and large-scale models, linearity and cultural weight of the line influenced the shape and structure, the ethos of architecture.*[1]

In her book *Architecture and the Burdens of Linearity* architectural theorist Catherine Ingraham suggests that the problematic of the line and linear representation in architecture exists because of the 'impossibility of discussing representation in any simple sense in architecture'.[2] Ingraham states that 'the use of geometry, line drawing, perspectival and other representational conventions, is not the scene of architecture; it is a precursor of a scene, the modelling of the scene'.[3]

Ingraham suggests that a common architectural understanding that 'the path from a model, template, or drawing to building has always been linear' and that 'nothing appears to be lost or gained in the translation from these modes of representation to the actual building' is a problematic that needs to be addressed.[4] For Ingraham 'there is nothing succinct – everything is torturous – about the line and linear representation in architecture'.[5] Her proposal is that we should look differently at such linear representations of architecture since:

> *The consciousness that the linear is both inescapable and burdensome in its inescapability and, simultaneously that if we trace certain paths and lines in architecture in order to find out where they lead, how they are fashioned, what makes them persuasive or not, or what makes them a burden, a pathology, a romance, or all these things, we will encounter and pass through certain interregnums where the load is slightly lighter and linearity reveals itself as something other than we thought it was going to be.*[6]

Ingraham's book is an attempt to examine and locate certain paths and lines in architecture in order to discover how they are made and their relationship with the forms of representation with which they are engaged. Ingraham offers us sources and strategies for thinking about architecture beyond representation; such sources and strategies are often located outside architecture as a discipline. Her research makes us aware of how non-architectural apparently different and sometimes non-representational practices, like literature for example, located outside architecture may precede or influence both the formation and the

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[1] Catherine Ingraham, *Architecture and the Burdens of Linearity*, (New Haven and London: Yale University Press, 1998) p. 4.
[2] Ingraham, *Architecture*, p. 4.
[3] Ingraham, *Architecture*, p. 4.
[4] Ingraham, *Architecture*, p. 4.
[5] Ingraham, *Architecture*, p. 4
[6] Ingraham, *Architecture*, p. 4-5.

reading of linearity that seems to be so fundamental to architecture. Her work also outlines possibilities for how to open-up discussions of linearity in architecture within an interdisciplinary context.

The importance of Ingraham's research is concerned for me with the relationships that she makes between different disciplines and architecture and how such disciplines may influence us to re-think the role of a line in architecture. My particular interest in Ingraham's research on linearity and architecture is in her ability to consider how concepts move across different areas of theory and practice, and her insistence that in order to understand representation we should search fields adjacent to architecture, ones that are often seen to be outside the architectural discipline. In particular, her research has suggested to me that I can open up my own questions by working between differing fields of theory and practice. Similar to Ingraham, my research is concerned with lines other than representation.

Ingraham's metaphor, 'burdens of linearity', suggests that architecture is positioned under the weight of its own line. Suggesting that 'the path from model, template, or a drawing to building has been always linear' and that 'nothing appears to be lost or gained in the translation from these modes of representation to the actual building' is a problematic that Ingraham wants to address.[7] In order to suggest that such path is in fact non-linear and because of that 'burdensome' for an architecture that wishes to assume linearity, Ingraham engages with just those ideas considered 'torturous' for architecture. She uses examples of plays, urbanism, geometry, literature, indigenous art and mathematics in order to demonstrate the connections between architecture and other disciplines and their influence in making architectural linearity 'burdensome'.

In order to investigate the influences that come from different disciplines and effect the conceptualization and execution of the line I have focused my research on the relationship between two particular disciplines that in my mind are allied to each other – art and architecture. My research on the line searches for ways of conceptualizing the line so its non-linearity is no longer 'burdensome' for architecture. In order to find such conceptualizations of the line I look at creative practices adjacent to architecture and the way such practices achieve lines. I search for the kind of line that has freed itself from a rigid linearity. Such a line for me is not primarily concerned with the joining and the fitting together of things, but a line that takes a walk between art and architecture, a line whose main property is its transfer of either concepts or techniques from other disciplines. This line, for me, is also located in the creative process.

I start this investigation by considering what are the kinds of lie outside of architecture and how these lines may inform architecture and space creation. I use Ingrahams work to identify the need to introduce the body into architectural representation, and how through

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[7] Ingraham, *Architecture*, p. 4.

technical mobility this may be done. These ideas are discussed in detail in the **Section 1.1: Lines Outside Architecture**.

Another rich source of inspiration for my research that came from architectural theory was Robin Evans' work in the posthumously published book *The Projective Cast: Architecture and Its Three Geometries* (1995). Evans' research is concerned with the complexity of representation in architecture in which, for him, geometry as a technique and experience plays a crucial role. Evans locates a particular relationship between geometrical drawings and the appearance of geometry in architecture. For Evans, such a relationship is not static but active. This activity occurs in the in-between space, a space where connections between thinking, imagination, drawing and building occur through various 'guises of projection' or 'processes that we have chosen to model on projection'.[8] For Evans these locations of activity create what he calls 'zones of instability' and in his opinion the most interesting questions regarding the relationship between architecture and geometry occur in these zones.[9] For Evans projection seems to be a way of interconnecting palpable experience and abstract mathematics, in which geometry is the 'doorway' between the 'real' and the 'mental'. Evans creates a diagram of the design process in which he tries to depict and explain the complex relationship between observer, designed object, perspective and orthographic projection.

My own interest in looking at the line in and outside of architecture focuses on Evans's 'zones of instability' examined from the side of an observer. Whilst Evans' argument looks at guises of projection I look at how projection occurs when we look at the lines themselves, or, more precisely, consider how a line may itself obtain the property of the observer. I expand Evans' ideas of projection by considering projection not only in the mind of the observer but also related to his/her body. I also try to expand Evans's diagram of relationships from the side of the observer in terms of the stages of creative process that occur before and during the process of realization of lines. My aim is to investigate what happens to the line once we focus our attention on the inseparability of the line from the body and how our idea of what Evans considers as projection may alter. Evans' ideas and the questions they raise for me will be discussed in detail in the **Section 1.2: De-Centering Lines**.

Philosopher and architectural theoretician Andrew Benjamin is one of the most recent voices to address the line in relation to architecture. In his lecture course *From Splines to Lines* at the Architectural Association, London, in 2005 Benjamin proposed that the line should be looked at as the 'after effect of that which constructs it'.[10] Suggesting that 'lines are

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[8] Robin Evans, *The Projective Cast: Architecture and Its Three Geometries*, (Cambridge, Massachusetts; London, England: The MIT Press, 1995), p. xxxi.
[9] Evans, *The Projective Cast*, p. xxxi.
[10] Andrew Benjamin, lecture series *From Splines to Lines*, Architectural Association, London, February 2005. The lecture series consisted of seven lectures where line has been looked at from a particular position: *Philosophy's Line*, *Drawing a Line Freud and Unconscious*, *Framing Pictures-Walter Benjamin on the Line*, *Malevich and Abstracting Line*, *Diagrams*, *Image of Different Lines*. All the notes taken from this lecture series are recorded by the author.

constructed'[11] and because of this there is always more than one condition that can be brought to bear upon the line, Benjamin opens up a way of re-thinking the line through practice and technique. In particular Benjamin states that the line has a presence that depends on the practice and technique with which it has been enacted.

Benjamin's interest in the line is also concerned with looking at the line beyond representation and his particular lecture from the series – *On Diagram*, which I found to be the most relevant to my own research, considers the indeterminate role of a line in a diagram. Benjamin refers to Gilles Deleuze's statement that a diagram exists 'prior to representation' [12] and he further elaborates the idea of the future in the diagram by stating that 'in the diagram there is a possibility of realizing that which is yet to come'.[13]

In my own research I also look at lines that are produced by techniques of particular creative practices and I focus on lines that create diagrams. I was inspired by Benjamin's suggestion that the 'diagram operates both prior to icons and prior to symbols' and 'in a sense presupposes the possibility of their eventuality' [14] Benjamin states that in order to allow for a future in the diagram 'the notion of final form vanishes'.[15] In other words, for something that is yet to come',[16] the future, there should be no completeness or finitude.

Benjamin states that the line is 'the finite state of infinite possibilities'.[17] In response I started consider the kind of line that makes a diagram. The ideas of Benjamin and the questions they raise are discussed in detail in the **Section 1.3: Becoming Lines**.

Questioning the role of paper as the background for a drawing, architectural theoretician Mark Wigley suggests that paper is usually never noticed in a gallery display, only the marks made on paper. Wigley suggests that paper appears to be almost invisible 'as if it occupies a liminal space between material and immaterial' that in turn 'allows it to act as a bridge across the classical divide between material and idea'.[18] Wigley also states that this 'blindness' to paper in the eyes of the observer 'allows physical marks to assume a status of immaterial ideas'.[19]

Wigley, like Benjamin, also states the importance of technique for drawings. Discussing Constant's drawings for New Babylon Wigley states that 'drawing techniques typically used in

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[11] Benjamin, *From Splines to Lines*, February 2005.
[12] Benjamin, 'On Diagram'.
[13] Benjamin, 'On Diagram'.
[14] Benjamin, 'On Diagram'.
[15] Benjamin, 'On Diagram'.
[16] Benjamin, 'On Diagram'.
[17] Benjamin, 'On Diagram'.
[18] Mark Wigley, 'Paper, Scissors, Blur', in *The Activist Drawing: retracing Situationist Architectures from Constant's New Babylon to beyond*, Catherine de Zegher and Mark Wigley (eds), (NewYork: The Drawing Center; Cambridge, Massachusetts; London: MIT Press, 2001), pp. 27-56, 29.
[19] Wigley, 'Paper, Scissors, Blur', p. 29.

architecture, those that seem to most properly belong to the architectural world (detailed plans, sections, and elevations) steadily give way in the project to those that are foreign in both technique and their almost complete blurring, distortion, or erasure of the architectural forms'.[20] In this sense, Wigley concludes that Constant's New Babylon drawings, which take an artistic approach, are 'a calculated assault on disciplinary limits, and drawing is a key part of the arsenal'.[21]

I also find the idea of the background to be important in my analysis of the line. Focusing on the background of the line and the technique of drawing lines, I considered that were we to examine projected lines, whose background may be any architectural surface, we may be able not so much to attack but further expand the disciplinary boundaries of architecture. The ideas of Wigley that introduce the importance of the background are discussed in detail in the **Section 1.4: Boundary Lines**.

In the **Section 1.5: Opening Lines of Enquiry** I return to the key points raised in each of the previous discussions. I propose extensions to the conceptualization of the architectural line by turning to the philosophical ideas of Gilles Deleuze and Elizabeth Grosz in order to create my own theoretical framework on the line. This framework considers mobility, materiality, immateriality and projection to be the line's main properties, through which, I believe, further extension of an architectural conceptualization of the line and the expansion of architecture's disciplinary boundaries may occur.

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[20] Wigley, 'Paper, Scissors, Blur', p. 37.
[21] Wigley, 'Paper, Scissors, Blur', p. 37.

## 1.1: LINES OUTSIDE ARCHITECTURE

For me, lines outside architecture are those that lie beyond architectural representation. In this thesis a line outside architecture and yet pertinent to architecture is one that is able to provide a connection to other ways of thinking and provides a connection between the virtual and the real. My aim is to suggest that architecture, as a discipline should be the site of multiple connections with other disciplines. In this sense, the line that I am referring cannot be considered only in terms of its representation. It is a line that creates new connections that can lead back to architecture.

To examine this outside line in more detail, I would like to turn to architectural theorist Catherine Ingraham. She discusses the example of Shakespeare's play *King Lear*, which she considers to be 'about the loss of a certain configuration of elements that confer power on Lear and preserve his sanity'.[22] The story of *King Lear*, for Ingraham, is concerned with the division of land and the role of the map as representation. She describes how at the beginning of play 'Lear has decided to divide his kingdom among his three daughters' in proportion to the extent which each daughter declares 'the quantity of her love for her father'.[23] Both elder daughters demonstrate their love for their father as Lear expects. However, when Cordelia, Lear's youngest and most favourite daughter fails to demonstrate the quantity of love expected in order to inherit her share of the land, her portion gets divided between the two elder sisters. When King Lear enters the stage in the play his first words are:

> *Meantime we shall express our darker purposes.*
> *The map there. Know we have divided*
> *In three our kingdom, and 'tis our first intent*
> *To shake all cares and business of our state,*
> *Confirming them on younger years.*[24]

Lear, in Ingraham's reading, assumes that he can divide his land between his three daughters, allocating to each of them a portion of land measured by the commitment of their love for him. What Lear assumes is that he, as the king, is the architect of these divisions, and that, although divided, he will still remain in control of the parts. Once divided, he assumes that he will be able to continue to find and navigate these newly divided places. From these assumptions Ingraham suggests that Lear's own tragedy starts to evolve. Ingraham outlines how the world of Lear is the 'classical world [...] where maps are just maps and the division of the proper name from its property is an innocent, inconsequential procedure – in other words, a world where kings are kings, architects architects, and plays plays, without these entities affecting each other improperly'.[25]

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[22] Ingraham, *Architecture*, p.5.
[23] Ingraham, *Architecture*, p. 22.
[24] William Shakespeare, *The History of King Lear*, Stanley Wells (ed.), (Oxford: Oxford University Press, 2000), p. 102.
[25] Ingraham, *Architecture*, p. 28-9.

Ingraham defines 'architectural losses – those concerned with maps, land (sites), drawn lines, shelter, and the architect (Lear himself)'.[26] She further suggests that what she discovers is 'first architecture in relation to property, which addresses political and economic domains of architecture; second the relation of architecture to propriety, which is about "keeping things in line"; and third, the relation of architecture to the proper name, which is about almost everything else'.[27]

According to Stanley Wells, a Shakespeare scholar and editor of The History of King Lear, it is not certain what the actual representation of the map appears in the play, but only that 'apparently Lear calls for a map to be produced.[28] As architectural academic Paul Hirst has pointed out, in the sixteenth century 'maps, as we understand them, were all but non-existent [...] at best there were itineraries, which listed towns and major features on the route to destination'.[29] Nonetheless, the concept of representing the ownership of geography by lines on paper was well established. For Ingraham, such a map 'proposes and yet fails to deliver the concrete world'.[30] She later states that 'we both evoke and elide the difference between the world of the map and the "other" world with that automatic gesture most commonly known as the gesture of representation'.[31] For this reason Ingraham states that, for her, King Lear concerns 'a representational crisis that had been confined to literary studies but that really belonged in important and unexplored ways to architecture'.[32]

Ingraham exposes what she calls a 'fault line' in architecture's own stability by bringing the story of *King Lear* into her discussion. In *King Lear* the map aims to represent the stable, classical world of division of property according to certain rules. What Ingraham illustrates with the play of *King Lear* is that this representational map is unstable. The map purports to represent the 'concrete' world but cannot do so because it fails to account for the lack of love demonstrated by one of Lear's daughters. Something is missing from the map, or is, in Ingraham's phrase, 'out of play'.

To describe the 'out of play' clearly requires a different idea of the map. According to Deleuze and Guattari, a map can be 'open, connectable in all its dimensions, and capable of being dismantled; it is reversible, and susceptible to constant modification'.[33] A map 'can be torn, reversed, adapted to montages of every kind, taken in hand by an individual, a group, or a social formation'.[34] Deleuze and Guattari also suggest the instability of the map as representation by suggesting that a map 'can be drawn on a wall, conceived as work of art,

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[26] Ingraham, *Architecture*, p.5.
[27] Ingraham, *Architecture*, p.5.
[28] Stanley Wells' editorial notes. See Shakespeare, *The History of King Lear*, p.102.
[29] Paul Hirst, *Space and Power: Politics, War and Architecture*, (Cambridge, England: Polity Press, 2005), p. 100.
[30] Ingraham, *Architecture*, p. 24.
[31] Ingraham, *Architecture*, p. 25.
[32] Ingraham, *Architecture*, p. 5.
[33] Gilles Deleuze and Felix Guattari, *On the Line*, John Johnston (trans.), (New York: Semiotext(e), 1983), p. 25.
[34] Deleuze and Guattari, *On the Line*, p. 26.

constructed as political action or as a meditation'.[35] For me, the illustration of *King Lear*'s map offers a way to think about the role of a line. If one aims to include within the discipline of architecture that which is presently 'out of play', what kind of lines are needed?

Ingraham pursues her investigation into the 'out of play' by considering the 'conventional' view of the line's immaterial and conceptual aspects. She brings to attention Alberti's view of the beginnings of architecture in which 'architecture begins with the *lineaments*, the outline of the architectural project in mind'.[36] She uses Joseph Rykwert's comments in the glossary to Alberti's text *On the Art of Building in Ten Books*, where '*lineamenta* has been translated variously as *disegni* (Bartoli), meaning drawings and designs; *Risse* (Theuer); "form" (Panofsky, *Idea*); and by Krautheimer as "definitions", "plan", and "schematic outlines"... We have translated it therefore as "lineaments", for the most part, encompasses "lines", "linear characteristics", and so by implication, design' [37] and in addition, Ingraham adds referring to Alberti, the 'act of conceptualizing a building'.[38]

What Ingraham critically concludes from her examination of lines as intellectual acts allows 'the joining and the fitting together of lines in the geometric imagination and the outline of the building' to be 'outside the material, or bodily, play of parts'.[39] Furthermore, she expresses the relationship between the material or bodily play of parts and the immaterial, intellectual aspects of the line through the following question: 'how can these *lineaments* be said to be out of play in the materiality they engender?'[40] This question for Ingraham is of crucial importance since she also aims to disturb the classical understanding of architecture that considers space as neutral. She regards as a particular folly in Dedekind, Pythagoras, Euclid, and Lobachevsky their concern with 'the intricate relation of the continuous magnitude to the construction of space and [...] the repression of countergeometric life, the everyday life, of the inhabiting body'.[41] She elaborates her concern by posing another question: 'How can it possibly be that sexuality (which in peculiar ways stands for the everyday) is routinely put out of play by classical concepts of spatiality?'[42]

Ingraham's suggestion is that 'sexuality in architecture, insofar as it is proprietorial, which it always must be in some form, makes itself known through some combination of the possession of space (property, body, house) and the possession of name (divided proper name, mark signature) – specifically, through the possession of space through marking'.[43] Although she accepts that architectural marking is usually called drawing, she suggests that there may be

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[35] Deleuze and Guattari, *On the Line*, p. 26.
[36] Ingraham, *Architecture*, pp. 58, 168.
[37] Ingraham, *Architecture*, pp. 58, 168.
[38] Ingraham, *Architecture*, p. 59.
[39] Ingraham, *Architecture*, p. 59.
[40] Ingraham, *Architecture*, p. 59.
[41] Ingraham, *Architecture*, p. 110.
[42] Ingraham, *Architecture*, p. 110.
[43] Ingraham, *Architecture*, p. 99.

a different kind of drawing which can better demonstrate this possession of space which she calls 'drawing/writing'.

Taking the example of the particular experiences described in a text by Stendhal (an autobiographical account called *The Life of Henry Brulard* where he uses sketches and text, drawing and writing, Ingraham suggests that these are such sites of drawing/writing. Stendhal presented in a series of drawn sketches and particular written sentences 'floor plans and site plans with some elevations – of all the rooms, villages, cities, landscapes, and roomscapes that he encountered as he was growing up'.[44] The sentences that he used in his sketches were quite descriptive: '"my father in an arm-chair"; "grandfather's green bedroom"; "where the mule kicked me"'.[45] Ingraham suggests that at these sites of drawing/writing, a certain possession of space takes place. She also cites examples where Stendhal marks himself with abbreviations of his own name, such as *'me'* or *'H'* (Henry).[46] For Ingraham these examples of drawing/writing introduce into architectural representation something that is often forgotten – the body that is inscribed in the line.

What Ingraham focuses on in Stendhal's sketches and writing is the body's own ability to mark various architectural spaces. Either drawn or written, Stendhal's markings were based on his own personal experience and memory. For Ingraham the occupation of space and bodily experiences are often un-represented in the conventional architectural line, and yet they seem to be exactly that which configures such lines. Ingraham states that 'it is in the particular configuration of the architectural line [...] that the drama between sexuality and spatiality begins to play itself out'.[47]

Feminist philosopher Elizabeth Grosz has also theorized the body's spatio-temporal location. Grosz argues that 'if bodies are to be reconceived, not only must their matter and form be rethought, but so too must their environment and spatio-temporal location'.[48] Grosz's thoughts focus on the body's location in the world, stating that 'the kinds of world we inhabit, and our understanding of our places in these worlds are to some extent an effect of the ways in which we understand space and time'.[49] In the context of Ingraham's idea that the body is 'out of play' with classical concepts of spatiality, Grosz's argument extends Ingraham's ideas by opening up a route to consider the role of the body in architecture from a standpoint in which the body is an instigator of spatial and temporal relationships.

Ingraham's analysis offers a rich source of starting points to consider what kind of lines are needed to describe the 'out-of-play'. From the illustration of *King Lear* we have seen how

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[44] Ingraham, *Architecture*, p. 92
[45] Ingraham, *Architecture*, p. 92
[46] Ingraham, *Architecture*, pp. 92-100.
[47] Ingraham, *Architecture*, p. 92.
[48] Elizabeth Grosz, *Space, Time and Perversion: Essays on the Politics of Bodies*, (New York & London: Routledge, 1995), p. 84.
[49] Grosz, *Space, Time and Perversion*, p. 97.

the classical concept of the line and projection fails to account for the 'the everyday life of the inhabiting body'.[50] Ingraham considers that a new form of 'drawing/writing' provides a way to represent the occupation and possession of space by the body. This is an example of what I shall call technical mobility – the transfer of a technique, in this case a combination of text and sketches – from one discipline to another. It immediately invites consideration of what other techniques conventionally regarded as outside architecture may provide. Deleuze and Guattari's notion that a map may be conceived as a work of art also invites consideration of another mobility – conceptual mobility – in which ideas from the other disciplines are brought to bear. Ingraham's attention to the particular configuration of the architectural line also focuses attention to a different aspect of the line: on the presence of the body in the material line itself; how the body inhabits the line's actual form.

I return to these questions in the final section of this Chapter, but now I wish to introduce a new aspect of the problematic of the line. Thus far, I have not considered the presence of the creative designer in the architectural line. To explore this further I turn in the next section to the work of architectural theorist Robin Evans to discuss the relationship between the experience of architecture and its geometry and how this relationship may influence the formation of lines.

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[50] Ingraham, *Architecture*, p. 110.

## 1.2: DE-CENTERING LINES

Robin Evans starts his book *The Projective Cast: Architecture and Its three Geometries* with the example of the Renaissance centralized church, asking the apparently simple question: 'Where is the centre of the centralized church?' [51] The usual assumption is that the centre lies at the crossing point of the lines of symmetry in the plan. However, Evans suggests that in fact 'a centralized church does not posses an unequivocal point that can be identified with the same alacrity'.[52] Taking the example of *Sant' Eligio degli Orefici* [53] Evans carefully finds nine possible locations for the centre of this centralized church *(Fig. 1.1).* One centre is the point on the floor beneath the dome, or at some point vertically above this where the eyes of an observer may be located. A second centre lies at the monstrance that stands on the high altar facing the entrance. A third centre may be located in the middle of the enclosed space, or where the dome is divided from the lower, supporting structure. A fourth centre lies where light converges from the arched windows around the drum and the lantern over the crown of the dome. A fifth centre may be located at the centre of the hemispherical dome. A sixth centre may be in the oculus of the dome, and, finally, a centre might be located beyond the dome in the miniature cap over the lantern or even in the orb mounted on the pinnacle outside.

Evans' search for the centre of a centralized church demonstrates that 'there has never been a completely centralized building'.[54] What Evans shows is that even the most commonly accepted architectural facts, such as the assumption of a single centre in a centralized church (which Evans suggests is often assumed by art historians like Rudolf Wittkower and Heinrich Wolfflin) can be destabilized by careful analysis, an analysis that hinges on the difference between what may be visually apparent when looking at an architectural representation and what the 'actual situation' may be once the observer is introduced into the space. Evans states, with respect to the certainty of a single centre in the centralized churches of the Renaissance that 'the difference between apparent and actual constitution has not been so easily seen'.[55] Evans emphasizes how the vision of the observer in architectural space – his or her perception, viewing position and focus – undermines the relationship established through architectural representation between the apparent and actual geometrical centres.

Through his examination of the relation between the apparent and actual geometry, Evans takes his argument further in order to engage with an ambiguity that exists between painting (specifically frescoes and icons) and architecture.

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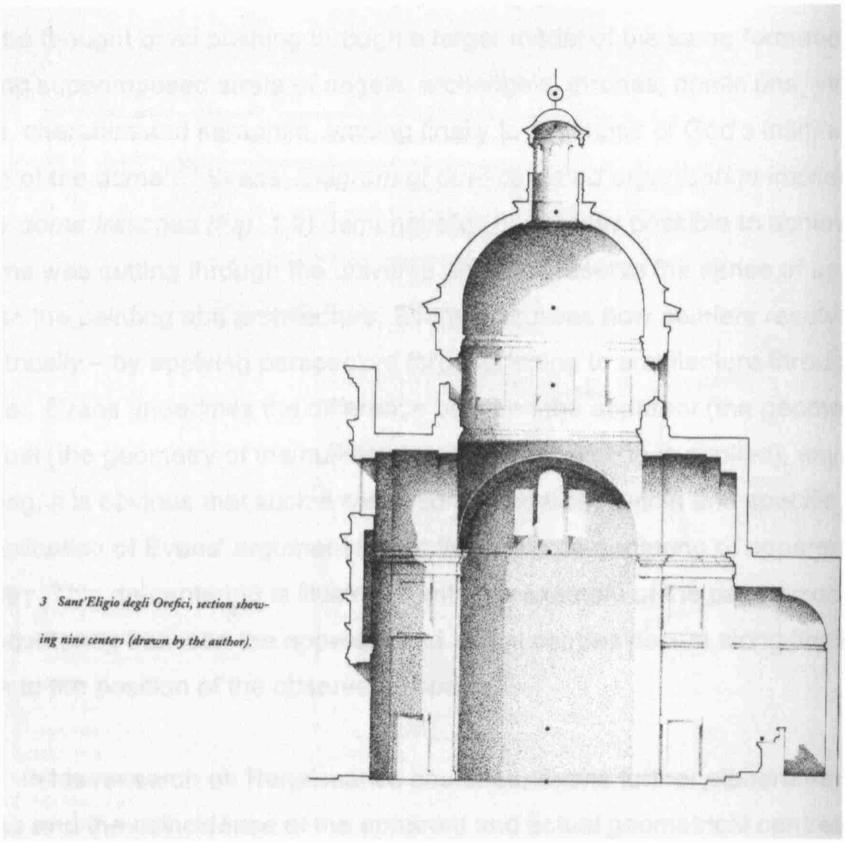
[51] Evans, *The Projective Cast*, p. 6.
[52] Evans, *The Projective Cast*, p. 6.
[53] '*Sant 'Eligio degli Orefici* is a small church built on a Greek cross plan built for the Corporation of Goldsmiths in Rome. It was designed in 1509, probably by Raphael, though some still argue for Bramante's involvement. After Raphael's death it was continued by Baldassare Peruzzi, who supervised the construction of the dome and lantern from 1533 until his own death in 1536.' See Evans, *The Projective Cast,* p. 7.
[54] Evans, *The Projective Cast*, p. 12.
[55] Evans, *The Projective Cast*, p. 16.



*3 Sant'Eligio degli Orefici, section showing nine centers (drawn by the author).*

Fig. 1.1. Robin Evans, *Sant Eligio degli Orefici, section showing nine centers*, rpt. in Robin Evans, *The Projective Cast: Architecture and Its Three Geometries*, (Cambridge, Massachusetts; London, England: The MIT Press, 1995), p. 10.

Rather than dealing with the referents that the icons in frescoes might provide, Evans is interested in the way in which frescoes have been applied inside churches. Evans discovers that the relationship between the painted (illusionary) surface of the inside of a church dome and the actual geometry of the dome are often not in geometrical accordance. In Evans' view, the domes of the early Renaissance churches were depicted as if they were cutting through the universe: 'The hemisphere of the dome, a model of the vault of heaven as seen from the earth, has to be thought of as pushing through a larger model of the same formation, like a great lens exposing superimposed strata of angels, archangels, thrones; dominions, virtues, principalities; powers, cherubim and seraphim, leading finally to a glimpse of God's infinite effulgence at the apogee of the dome'.[56] Evans' *Diagram of dual-centered organisation implied by sixteenth-century dome frescoes (Fig. 1.2)* demonstrates how it was possible to achieve this effect as if the dome was cutting through the universe and yet preserve the sense of apparent unity between the painting and architecture. Evans discusses how painters resolved these problems geometrically – by applying perspective foreshortening to architecture through painting.[57] However, Evans underlines the difference between the apparent (the geometry of painting) and the actual (the geometry of the building to which the painting is applied), saying that 'however satisfying, it is obvious that such a resolution is 'localized within and specific to the illusion'.[58] The implication of Evans' argument is that there is a de-centering of apparent and actual geometry. This de-centering is illustrated with the example of the centralized church, in which the de-centering between the apparent and actual centres occurs along lines of vision and in relation to the position of the observer in space.

In his research on Renaissance churches, Evans further elaborates how painting, frescoes and the coincidence of the apparent and actual geometrical centres of architecture and painting took place in turn in the illusionary strategies of envelopment, emanation and equivocation. He suggests that God's power, for example, is represented in terms of emanation in paintings, for example the emanation of light from a single source, while God's love is represented in terms of envelopment.[59] The representational strategies that artists developed were concerned with ideas like 'glow', in order to depict spiritual nature or light as 'God's nearest approximation'.[60] With respect to architecture, the idea that 'in the centralized churches the centres are vacant and invisible' was complicated by the fact that the 'spherical surface includes pictures of its own displaced centre'. In Evans' opinion this was achieved through 'fusion [...] not only by perspectival illusions, but also by the pleonastic distribution of centres within these buildings'.[61]

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[56] Evans, *The Projective Cast*, p. 20.
[57] Evans, *The Projective Cast*, pp. 20-23.
[58] Evans, *The Projective Cast*, p. 21.
[59] Evans, *The Projective Cast*, p. 23-5.
[60] Evans, *The Projective Cast*, p. 25.
[61] Evans, *The Projective Cast*, p. 40.

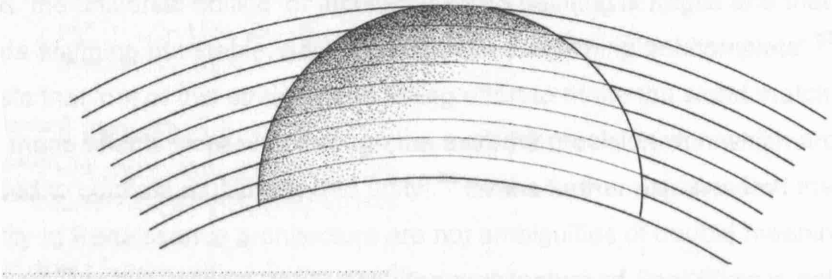

Fig. 1.2. Robin Evans, *Diagram of dual-centered organization implied by nineteenth century dome frescoes, rpt.* in Robin Evans, *The Projective Cast: Architecture and Its Three Geometries*, (Cambridge, Massachusetts; London, England: The MIT Press, 1995), p. 21.

The real importance of Evans' observations lies not only in observing that the relationship between painting and architecture seems to fuse the differently displaced centres of the two, but that each centre was governed by its own geometry and illusions deployed to cover-up such geometrical de-centerings. From these observations Evans concludes that what he calls 'the universal edifice' of architecture and painting is fragile and that such an edifice 'appears anything but stable, anything but unified, anything but complete'.[62] Evans further suggests that 'out of this strained and failing effort to make the world match its representation [...] all these effects were won through the extreme precision with which architectural ambiguity was used to conflate multiplicity into unity'.[63] Evans further explains that the 'ambiguities of centrality in Renaissance architecture are not ambiguities of double meaning but of multiple meanings'.[64] In this respect, for Evans, 'the architecture of *Sant'Eligio* is not an architecture that reflects a culture in its fullness, but an architecture that reflects incompleteness with a compensating image'.[65]

Evans expands his argument by suggesting that 'while architecture provided the opportunity to force substance into geometric shapes, the allied business of surveying provided an opportunity to divest geometry of this same task as soon as it was turned from designing of perfect architectural forms to the recording of imperfect ones'.[66]

The idea of using a rigid strategy, working out from a centre, was not only used in the design of centralized buildings but also in cartography. Maps were drawn by starting with 'an arbitrary defined circle from the centre of which equally spaced radii extended' even though the arbitrary centre was the 'only point of correspondence between the geometrical figure and the shape of settlement surveyed'.[67] Here the measurements were taken along the radial lines, although the settlements did not have to be radial in shape. Evans suggests that in the example of cartography, geometry was an 'overlay rather than underlay to reality' and as such 'was in the odd position of gaining descriptive power as it relinquished its direct hold over the form of what it described'.[68]

By discussing and demonstrating the gap between the apparent and the actual in relation to centrality and architecture as well as in the examples of cartography, Evans outlines the particular importance to geometry to the construction of lines. He suggests that geometry should be considered a shifting, in-between 'place', that is not intrinsic to the mere compositional construction of a future building, but rather as a 'place' of operation at two ends of architecture –before and after the building. He suggests that: 'in geometry, geometrical figures

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[62] Evans, *The Projective Cast*, p. 43.
[63] Evans, *The Projective Cast*, pp. 43-4.
[64] Evans, 'Notes', *The Projective Cast*, p. 377.
[65] Evans, *The Projective Cast*, p. 44.
[66] Evans, *The Projective Cast*, p. 44.
[67] Evans, *The Projective Cast*, p. 45.
[68] Evans, *The Projective Cast*, p. 45.

are not media, but in architectural design they are, since their task is to convey shape from one state to another' and as such 'they have the peculiar property of being changeless in themselves and volatile in relation to everything else'.[69] Evans states that 'since architecture is made with geometry, architecture should provide an evacuated sample of imaginary construction'.[70] In Evans' opinion 'between geometry and architecture we have somehow hopped from inside the mind to outside' which for Evans means that 'when dealing with architectural geometry, we seem to be dealing with this route or doorway between mental and real'.[71] In this process of 'hopping' between inside and outside, between mental and real, Evans gives primacy to projection. He states that 'projection has leapt from the drawing board into the mind, where it has been installed as an element that aids the construction and maintenance of the thinking self as we know it'.[72] Furthermore, Evans suggests that 'we have fabricated our subjectivity from manufactured parts that were the manifest evidence of constructive consciousness in the first place: the elements of geometry'.[73]

For Evans 'design is action at a distance' and the architect's art lies in the arrangement of emanations from drawings to buildings, and from buildings to the experience of the perceiving and moving subject, where these emanations create unstable voids that cannot be easily portrayed in design.[74] Here, projection provides a way of connecting 'palpable' experience and abstract mathematics, where geometry is the 'doorway' between the real and the mental. Evans tried to summarise his argument with in a diagram: *Projection and its Analogues: The Arrested Image. (Fig. 1.3)* The diagram has four objects: an observer, a designed object, its orthographic projection, and a pictorial or perspective image. Evans himself was not happy to understand the diagram as giving primacy to the designed object positioned at its centre, and he suggested that the diagram should be 'best thought of as a tetrahedron'.[75] Lines, connect these objects and attempt to define and illustrate what Evans calls a 'field' or 'space' of 'projective transmission'.[76] Evans states that 'projection operates in the intervals between things' and is 'always transitive'. With the diagram Evans was, in his own words, 'attempting to portray the extent of projection and its metaphors'.[77]

My particular interest in Evans' diagram is with the observer. He or she lies on the right of the diagram and is equipped with perceptive and imaginative facilities. I was particularly interested in lines 2, 7, and 6 that connect the observer with the other elements: the designed object, its orthographic projection, and a pictorial or perspective image. In describing line 2, which runs between the observer and the orthographic projection, Evans states that this line demonstrates the 'perspectival space (three-dimensional) defining the optical route between a

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[69] Evans, *The Projective Cast*, pp. 37-8.
[70] Evans, *The Projective Cast*, p. 354.
[71] Evans, *The Projective Cast*, p. 354.
[72] Evans, *The Projective Cast*, p. 359.
[73] Evans, *The Projective Cast*, p. 359.
[74] Evans, *The Projective Cast*, p. 363.
[75] Evans, *The Projective Cast*, p. 368.
[76] Evans, *The Projective Cast*, p. 366.
[77] Evans, *The Projective Cast*, p. 366.

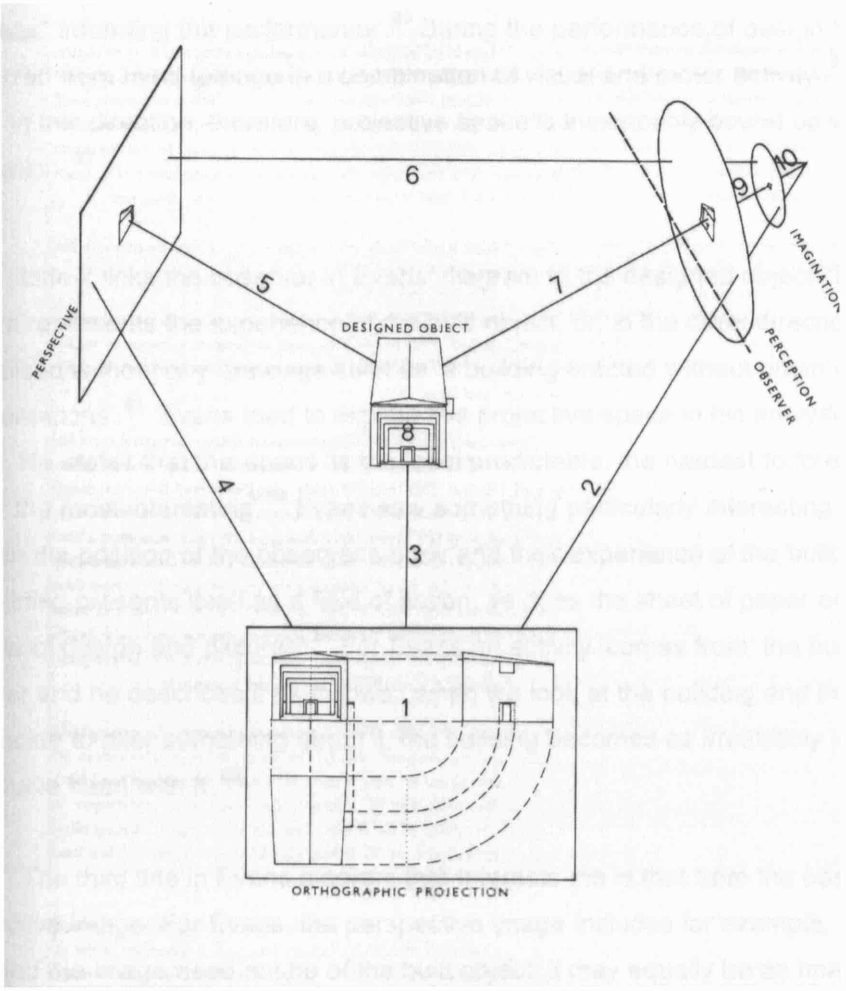


Fig. 1.3. Robin Evans, *Projection and its analogues: The Arrested Image*, rpt. in Robin Evans, *The Projective Cast: Architecture and Its Three Geometries*, (Cambridge, Massachusetts; London, England: The MIT Press, 1995), p. 367.

mobile, perceiving subject (observer or author) and an orthographic design'.[78] For Evans 'this route is fairly straightforward from the design drawing to the observer, but in the reverse direction it is far more complex'. [79] This 'reverse' direction describes the creation of the projection. Evans suggests that 'designing is a performance during which vision maintains a constant interaction between manual movement and resulting inscriptions' but also that 'there are "ideas" informing the performance'.[80] During the performance of design these ideas 'are transferred from mind to page in a combination of visual and motor activity'.[81] According to Evans 'in this direction, therefore, projective space is inextricably bound up with mobility and imagination'.[82]

Line 7 links the observer in Evans' diagram to the designed object. This line in Evans' diagram represents the experience of the built object, or, in the other direction, to designs that are realised without any drawings such as 'a building erected without preliminary representations'.[83] Evans tried to explain this projective space in his analysis of the centralized church. He states that this space 'is the least predictable, the hardest to foresee, and therefore usually the most interesting'.[84] Evans saw something particularly interesting in the relationship between the position of the observer's body and their experience of the built object, stating that 'the building presents itself as a field of action, as does the sheet of paper or a viewfinder in the contexts of design and pictures'.[85] For Evans an activity 'comes from' the building to the observer and he describes it as follows: 'when we look at the building and imagine it otherwise, then decide to alter something about it, the building becomes as irresistibly impressed with us as we have been with it'.[86]

The third line in Evans diagram that interests me is that from the observer to the perspective image. For Evans, the perspective image includes for example, books, slides or films, and the image need not be of the built object; it may equally be an image that inspired a design. It is described by Evans as a 'perspectival space (three-dimensional) between derived pictures and perceiving subject'.[87] Evans suggests that the reverse activity would make the observer a manipulator/creator of the picture'.[88]

Although there is little that is 'classical' in Evans' ideas of projection, elements of his diagram are – the orthographic drawing as the outcome of the design process, the primacy of the observer's visual perception over any other faculty and the distinction between the orthographic drawing and the perspectival image. These distinctions then necessarily generate

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[78] Evans, *The Projective Cast*, p. 368.
[79] Evans, *The Projective Cast*, p. 368.
[80] Evans, *The Projective Cast*, p. 368.
[81] Evans, *The Projective Cast*, p. 368.
[82] Evans, *The Projective Cast*, p. 368.
[83] Evans, *The Projective Cast*, p. 369.
[84] Evans, *The Projective Cast*, p. 369.
[85] Evans, *The Projective Cast*, p. 369.
[86] Evans, *The Projective Cast*, p. 369.
[87] Evans, *The Projective Cast*, p. 369.
[88] Evans, *The Projective Cast*, p. 369.

distinct 'projective spaces' and in turn distinct 'projective transmissions' between the mind of the observer and the material objects. But if we allow, as we outlined in the previous section, that there may be concepts, or techniques, that fall outside this framework but that may lead equally to some kind of 'built object' these distinctions seem both narrow and in a certain sense arbitrary. There is no particular reason to distinguish particularly between the orthographic drawing and the pictorial or perspectival image.

Secondly, Evans regards the observer's perception as primarily visual. He describes design as a 'performance during which vision maintains a constant interaction between manual movement and resulting inscriptions'.[89] But again, if we allow that the 'orthographic drawing' may be, for example, a part-drawn part-made drawing, there is no particular reason to regard vision as the primary source of perception. It may equally well be touch. Even in drawing there is considerable tactile feedback between the hand and the eye. Again, Evans' route to the imagination (the more rightwards and smaller of the two discs that constitute the observer in the figure) is via perception. But in design, intuition may play at least an equal part, and such intuitions may be visual, that is, come to mind as a picture, or tactile, that is, come to mind as a desire to create a particular sensation or feeling.

These considerations lead us to the view that Evans' diagram is both restricted in the range of objects with which the observer may interact, and also artificially distinct in the nature of these interactions. In describing the relationship between observer and the objects Evans variously calls the observer the 'observer', 'author' or 'manipulator/creator'.[90] But in the process of design the experience of the 'perspective image' and 'orthographic drawing' may be combined. For this reason, I have in later discussions of Evans' diagram adopted the term 'observer/creator'.

My thoughts and reactions to this part of the diagram have been further inspired by my readings of Deleuze on the subject of the 'actual' and the 'virtual'. Deleuze suggests that 'purely actual objects do not exist' and that 'every actual surrounds itself with a cloud of virtual images'.[91] This 'cloud' for Deleuze 'is composed of a series of more or less extensive coexisting circuits, along which the virtual images are distributed, and around which they run'.[92] In addition, Deleuze describes how 'these virtuals vary in kind as well as in their degree of proximity from the actual particles by which they are both emitted and absorbed'.[93] He further states that 'it is the dramatic identity of their dynamics that makes perception resemble a particle: an actual perception surrounds itself with the cloud of virtual images, distributed on increasingly remote, increasingly large, moving circuits, which both make and unmake each other'.[94] Finally, Deleuze

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[89] Evans, *The Projective Cast*, p. 368.
[90] See Evans' text on description of the diagram. Evans, *The Projective Cast*, pp. 368-9.
[91] Gilles Deleuze, 'The Actual and the Virtual', Eliot Ross Albert (trans.), Gilles Deleuze and Claire Parnet *Dialogues II*, Hugh Tomlinson and Barbara Habberjam (trans.), (London and New York: Continuum, 2006), pp. 112-15, 112.
[92] Deleuze, 'The Actual and the Virtual', p. 112.
[93] Deleuze, 'The Actual and the Virtual', p. 112.
[94] Deleuze, 'The Actual and the Virtual', p. 112.

suggests that 'it is by virtue of their mutual inextricability that virtual images are able to react upon actual objects' and 'from this perspective, the virtual images delimit a continuum'.[95] This idea of the virtuals as clouds surrounding and in a kind of gravitational relationship with actual particles seems to me a description of how the design process works – from a constellation of ideas there may be a 'gravitational' pull leading to the actualization of the virtual into an image, drawing or painting.

According to Deleuze, in the process of painting, the relationship between the eye and the hand 'pass[es] through dynamic tensions, logical reversals and organic exchanges and substitutions'.[96] This is what Deleuze describes as a process of 'movement' and 'reversibility', in which 'one might say that painters paint with their eyes, but only insofar as they touch with their eyes'.[97]

Deleuze's suggestions have also raised question in my mind concerning the role of the actual and the virtual in Evans' diagram. I think that the relationship between the observer-creator and orthographic projection drawing may be much more complex than Evans suggested. I imagined the line between them to be more like the trajectories of clouds containing particles of intuition and perception. This line may be seen as an intuitive trajectory on which the body sets itself in creative motion. Deleuze's ideas on life and virtuality aid an understanding of these lines as action, while Grosz's conceptualizations of the body allow a focussing of the notion that in a creative process the body and the line may converge and acquire each other's properties.

Deleuze suggests that 'a life is everywhere, in all the moments that a given living subject goes through and that are measured by given lived objects: an immanent life carrying with it the events or singularities that are merely actualized in subjects and objects'.[98] For Deleuze, 'a life contains only virtuals' and 'it is made up of virtualities, events, singularities'.[99] However, Deleuze outlines that 'virtual is not something that lacks reality but something that is engaged in a process of actualization following the plane that gives it its particular reality'.[100] For Deleuze, 'to create is to lighten, to unburden life, to invent new possibilities of life' and here 'the creator is legislator-dancer'.[101] In relation to Deleuze's version of the creative process and the creative experience suggested by Evans' diagram, in which design is a performance that contains ideas, images and experiences from everyday life, the idea of dancing proposes a particular movement that occurs between the observer-creator and the designed object. The movement that I am thinking of as a dance corresponds to Deleuze's suggestion that 'there is no longer a tripartite division between a field of reality (the world), a field of representation (the

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[95] Deleuze, 'The Actual and the Virtual', pp. 112-13.
[96] Deleuze, *Francis Bacon*, p. 154.
[97] Deleuze, *Francis Bacon*, p. 155.
[98] Gilles Deleuze, *Pure Immanence: Essays on Life*, Anne Boyman (trans.), (New York: Zone Books, 2001), p. 29.
[99] Deleuze, *Pure Immanence,* p. 31.
[100] Deleuze, *Pure Immanence,* p. 31.
[101] Deleuze, *Pure Immanence,* p. 69.

book) and the field of subjectivity (the author)' but 'rather an arrangement [that] connects together certain multiplicities caught up in each of these orders'.[102] For Deleuze, 'between things does not designate a localizable relation going from one to the other and reciprocally, [...] but a stream without beginning or end, gnawing away at its two banks and picking up in the middle'.[103]

I believe that these ideas presuppose the role of the body as a pivot of exchange between these fields. Grosz, in referring to the work of Maurice Merleau-Ponty, states that the body 'is defined by its relations with objects and in turn defines these objects as such – it is "sense-bestowing" and "form-giving", providing a structure, organization, and ground within which objects are to be situated and against which the body-subject is positioned'.[104] She further suggests that 'the relation between subject and objects is thus not causal but based on sense and meaning'.[105] Grosz's idea is that 'the relations of mutual definition governing the body and the world of objects are "form-giving" insofar as the body actively differentiates and categorizes the world into groupings of sensuous experience, patterns of organization and meaning'.[106]

In relation to Evans' diagrammatic line drawn between the designed object and the observer/creator, the body of the observer/creator, as described by Grosz, is a mobile agent, the pivot of the exchange between the world and its own creative interiority. When talking about life and creativity, Grosz suggests that in order to realize something new and creative, there has to be a process of actualization and that this 'involves the creation of heterogeneous terms'.[107] For Grosz in this process there is a movement from a virtual unity to an actual multiplicity and this movement 'requires a certain leap of innovation and creativity, the surprise that the virtual leaves within the actual'.[108] Evans's line between the designed object and the observer/creator becomes even more dynamic when considered in the light of Grosz's view concerning creativity and innovation. A line in the diagram may be required to represent movement from a virtual unity to an actual multiplicity that contains a 'leap of innovation and creativity'. This in turn demands that the line may also need to possess an elasticity of connection.

To address the issues that this discussion of Evans' diagram has raised, (and which I shall return to in the final section of this chapter) I turn now to Andrew Benjamin's illuminating argument concerning the relationship between the line and the diagram.

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[102] Deleuze, *On the Line*, p. 52.
[103] Deleuze, *On the Line*, p. 58.
[104] Elizabeth Grosz, *Volatile Bodies: Toward a Corporeal Feminism*, (Bloomington and Indianapolis: Indiana University Press, 1994), p. 87.
[105] Grosz, *Volatile Bodies*, p. 87.
[106] Grosz, *Volatile Bodies*, p. 87.
[107] Elizabeth Grosz, 'Thinking the New: of Futures yet Un-thought', Elizabeth Grosz (ed.), *Becomings: Explorations in Time, Memory, and Future*, (Ithaca and London: Cornell University Press, 1999), pp.15-28, 27.
[108] Grosz, 'Thinking the New', p. 27.

## 1.3: BECOMING LINES

In February 2005 architectural theorist and philosopher Andrew Benjamin delivered a six-part lecture course entitled *From Splines to Lines* at the Architectural Association School of Architecture, London. During the course Benjamin theorized on differences in types of line, suggesting that there are various lines, a line in philosophy, a psychoanalytic line, an abstract line and so on. I appreciated the focus given to the line in these lectures; the focus even provided a perspective different from the one I was investigating in my own research. I found the most interesting lecture for me and my own research was the one in which Benjamin actually talked least about the line, and yet at the same time the line was a significant force behind his discussion. This was the lecture 'On Diagram'. In this lecture Benjamin suggested that in a design process a diagram is a form of drawing that can be understood as proposing something 'yet to come'.[109] The thing that is 'yet to come' is something Benjamin called the 'potentiality' of the future of the yet unknown (and in the context of his lecture course he was alluding to the future in the process of design). Benjamin suggested that the diagram possesses a potentiality that is open to interpretation, its notations are without 'symbolic' or 'iconic' investment and so the diagram 'allows for another existence' and 'the possibility of realizing that which is yet to come'.[110]

In opening 'On Diagram' Benjamin suggested that the 'diagram operates both prior-to icons and prior-to symbols' and 'in a sense, presupposes the possibility of their eventuality'.[111] His emphasis was on the prior, on the before, and on the possibilities that the diagram may bring to architecture. Benjamin further elaborated this sense of possibility in relation to Deleuze's definition that the diagram exists 'prior to representation'.[112] However, Benjamin also added that with this idea of the future, 'the notion of final form vanishes'.[113]

Benjamin argued that ideas of incompleteness in which the notion of the final form vanishes required abstraction. He suggested that the diagram because it 'plays a role in deterritorializing... allows for abstraction'.[114] For Benjamin 'the notion of abstraction' in the diagram 'has to be thought in relation to potentiality'.[115] The 'potentiality' of the diagram was not to be used 'to think volume, but to think spatial relations and programmatic considerations'.[116]

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[109] Andrew Benjamin, quoting Deleuze in his lecture 'On Diagram', from a lecture course *From Splines to Lines* delivered at the Architectural Association School of Architecture, (London: AA Lecture Archive, 2 February 2005, DVD, 67min, 6/8).
[110] Benjamin, 'On Diagram', February 2005.
[111] Benjamin, 'On Diagram', February 2005.
[112] Benjamin, 'On Diagram', February 2005.
[113] Benjamin, 'On Diagram', February 2005.
[114] Benjamin, 'On Diagram', February 2005.
[115] Benjamin, 'On Diagram', February 2005.
[116] Benjamin, 'On Diagram', February 2005.

Thinking of a diagram as a drawing that exists prior to representation locates the diagram as a place in-between the idea and its representation. Benjamin's view of the diagram has its philosophical roots in Deleuze and Guattari's concepts of 'deterritorialization' and movement. Benjamin defines movement in relation to a certain territory: 'the movement by which something escapes or departs from a given territory'.[117] What moves and escapes from a given territory in the diagram, for Benjamin, is the notion of finitude, and formal completeness. In discussing how this movement takes place Benjamin suggests that the 'processes of deterritorialisation are the movements which define a given assemblage since they determine the presence and the quality of "lines of flight"'.[118]

In their essay *On the Line* Deleuze and Guattari use the metaphor of a book in order to explain processes of 'deterritorialization' and the roles of the 'lines of flight' in this process. They suggest that 'a book has neither subject nor object; it is made up of variously formed materials, of very different dates and speeds'.[119] Furthermore, they suggest, that 'in a book, as in everything else, there are lines of articulation or segmentation, strata, territorialities; but also lines of flight, movements of deterritorialization and of destratification'.[120] In addition 'the comparative rates of flow along these lines produce phenomena of relative slowness and viscosity, or alternatively of precipitation and rupture'.[121] In this sense, for Deleuze and Guattari 'these lines and measurable speeds constitute an arrangement (agencement)'.[122] Furthermore for them 'an arrangement is [...] growth of dimensions in a multiplicity that necessarily changes its nature as it increases its connections'.[123] 'Multiplicities' for Deleuze and Guattari 'are defined by the means of the outside: by the abstract line, the line of flight or of deterritorialization following which they change nature by being connected with others'.[124] Taking the example of musician Glenn Gould's quickened piano performance Deleuze and Guattari emphasize the importance of lines in an arrangement when they suggest that 'when Glenn Gould speeds up the performance of the piece, he is not simply being a virtuoso; he is transforming the musical points into lines, and making the ensemble proliferate'.[125]

The importance of Deleuze and Guattari's 'lines of flight' to Benjamin's analysis of the diagram is that these lines define a form of creativity specific to that arrangement – an assemblage – and Benjamin refers particularly to a diagram. Benjamin suggests that 'lines of flight' effect the transformation of particular arrangement.[126] This transformation for Benjamin occurs through 'deterritorialisation'.

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[117] Paul Patton, 'Deterritorialisation+Politics', *The Deleuze Dictionary*, ed. by Adrian Parr, (Edinburgh: Edinburgh University Press, 2005), p. 70.
[118] Benjamin, quoting Deleuze, 'On Diagram', February 2005.
[119] Deleuze and Guattari, *On the Line*, p. 2.
[120] Deleuze and Guattari, *On the Line*, p. 2.
[121] Deleuze and Guattari, *On the Line*, p. 2.
[122] Deleuze and Guattari, *On the Line*, p. 2.
[123] Deleuze and Guattari, *On the Line*, p. 15.
[124] Deleuze and Guattari, *On the Line*, p. 16.
[125] Deleuze and Guattari, *On the Line*, p. 15.
[126] Patton, 'Deterritorialisation+Politics', p. 70.

For Benjamin the concept of deterritorialisation involves a process, movement, lines and relationships that configure the future that is 'yet to come'. In such a process Benjamin sees the lines of flight as forces beyond representation that call for a particular action. For Benjamin, process, movement, lines and relationships can be understood spatially and temporally as a diagram.

Considering architecture's ambiguous relationship with the material of the world and the immaterial of the idea, Benjamin further elaborates his discussion on the diagram by suggesting that 'architecture is unthinkable without the material and immaterial relationship'.[127] The relationship between the material and immaterial in the diagram for Benjamin involves a kind of 'plurality' that can involve simultaneous actions and relationships along the material and immaterial lines that operate *in* a diagram and which open up numerous possibilities for differing evolvement of forms *from* a diagram. This plurality is essential to the lines of a diagram that, as Benjamin suggests, 'resist the way a drawing has to resist the notion of predictability'.[128]

In relation to Benjamin's analysis of a diagram I explore in this thesis how properties of the line that resist the notion of predictability form a moving trajectory and which suggest the future that is yet to come. Such lines I argue may be regarded as line of becoming. Furthermore, I argue that these lines are forces or transformative agents between the virtual and actual in a design process.

Grosz suggests that 'a concept of the new provokes' something that she calls 'strange vectors of becoming'.[129] Grosz develops her argument of the concept of the new using the idea of these 'strange vectors of becoming'. Grosz also indicates that 'becoming is what immerses both matter and information'.[130] In defining her concept of the new, Grosz, similarly to Benjamin in his discussion of the diagram, resists the notion of predictability, but in addition she links the new to the movement of actualization between the virtual and the actual in which she sees the emergence of innovation. Grosz states that contrary to any pre-existing plan or program 'the movement of actualization is the opening up of the virtual to what befalls it'.[131]

For me, the notion of movement, resistance to predictability and openness to the future – that which is 'yet to come' – define the properties of lines and are explored further in this thesis. This exploration considers lines as becomings, without beginnings and without ends.

Before returning to these issues in the final section of this chapter I turn now to discuss the last part of my theoretical interest in relation to the line – the background of the line and how

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[127] Benjamin, 'On Diagram', February 2005.
[128] Benjamin, 'On Diagram', February 2005.
[129] Grosz, *Becomings*, p. 15.
[130] Grosz, *Becomings*, p. 24.
[131] Grosz, *Becomings*, p. 27.

the techniques by which the line is produced may influence architecture's disciplinary boundaries. Mark Wigley's essay 'Paper, Scissors, Blur' has been important in opening up a discussion of the background of the line and its ability to transgress the boundaries of architecture. I would like to turn to this discussion in greater detail in the following **Section 1.4: Boundary Lines**.

## 1.4: BOUNDARY LINES

In his essay 'Paper, Scissors, Blur', contemporary architectural theoretician Mark Wigley discusses Constant Nieuwenhuy's drawings for New Babylon (1960) and questions the role of paper as the background for a drawing. Wigley suggests that paper is usually never noticed in a gallery display. Instead, it is the marks made on the paper that are noticed. Wigley states that the paper is usually treated as if it were not quite present. Unnoticed paper for Wigley acquires a special place: 'a liminal space between material and immaterial' which in turn 'allows it to act as a bridge across the classical divide between material and idea'.[132] For Wigley 'a certain way of looking at paper, or rather a certain blindness to it, allows physical marks to assume the status of immaterial ideas'.[133] Thus, conventionally, it is the marks that give us access to the mind of the creator.

New Babylon – a city of the future in which childlike play would be the organising principle – emerged from sculptural models. The models were 'extremely sophisticated architectural statements'.[134] In his essay Wigley highlights how Constant's drawings were drawn after the making these physical models of New Babylon and that their role was to 'give the stunning models the status of architecture rather than sculpture'.[135] Wigley states that 'the project was part of a whole generation of radical proposals for the idealized city of the future and was at once celebrated and criticized as it became well known in the architectural community in the early 1960s'.[136] Wigley outlines how in Constant's project the 'role of drawing is enigmatic'.[137] He draws parallels with traditional architectural practice suggesting that in Constant's project there were no working drawings and that the drawing was not a transitional stage in the production process nor was the drawing located at the very end of the design process as a presentation.

The suggestion that the drawing is 'enigmatic' because it lies outside the traditional architectural process of design in which drawings are usually situated between the idea and realization of a project, allows Wigley to question not only the status of a drawing but also the boundary of the discipline of architecture. Wigley observes that even today, the experience of architects viewing the models is 'typically one of shock, then confused admiration".[138] Wigley outlines how the variety of techniques that Constant used, such as collage and cutting paper by scissors, also employed techniques that were not traditional architectural techniques at the time, like ink and pen. As drawings these techniques 'assumed a very different role and character'

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[132] Mark Wigley, 'Paper, Scissors, Blur', *The Activist Drawing: retracing Situationist Architectures from Constant's New Babylon to beyond*, Catherine de Zegher and Mark Wigley (eds), (New York: The Drawing Center; Cambridge, Massachusetts; London: The MIT Press, 2001), p. 29.
[133] Wigley, 'Paper, Scissors, Blur', p. 29.
[134] Wigley, 'Paper, Scissors, Blur', p. 37.
[135] Wigley, 'Paper, Scissors, Blur', p. 31.
[136] Wigley, 'Paper, Scissors, Blur', p. 27.
[137] Wigley, 'Paper, Scissors, Blur', p. 32.
[138] Wigley, 'Paper, Scissors, Blur', p. 37.

from traditional drawings[139] and in consequence 'the drawings that followed the models are likewise a mechanism of disciplinary displacement or confusion'.[140]

Wigley observes that as the concept of New Babylon emerged, Constant gradually departed from the convention that the background paper was unnoticeable. Constant used 'traditional art paper to notebook sheets, tracing paper, Xerox paper, collotype paper, printing paper, and photographic paper'.[141] In this way, he fore-grounded the background. For Wigley, Constant's drawings' 'steadily lure architects from the familiar to the unfamiliar'.[142] Wigley states that 'despite the promiscuity of drawing techniques typically used in architecture, those that seem to most properly belong to the architectural world (detailed plans, sections, and elevations) steadily give way in the project to those that are foreign in both technique and their almost complete blurring, distortion, or erasure of the architectural forms'.[143] In Wigley's opinion 'for the art world, the effect is reverse' as 'unfamiliar subjects and techniques give way to the familiar'.[144] In this sense Wigley concludes that Constant's use of artistic approaches and techniques make New Babylon 'a calculated assault on disciplinary limits, and drawing is a key part of the arsenal'.[145]

In this thesis I am interested in further extending the ideas of Wigley's argument. Wigley's description of Constant's New Babylon provides an example of how what I have termed technical mobility introduces new ways of architectural representation. Constant's aim was to present a concept of a city that was continuously reconfigurable by its inhabitants, a city in which 'architecture was the only game in town'.[146] By its nature, this concept could not permit a detailed representation of the actual built structures since these were supposed to be a matter for the inhabitants themselves. By bringing the previously un-noticed background paper to the fore, and by using 'drawing' techniques more familiar to art, Constant was able, in Wigley's opinion, to represent the concept while remaining true to it. To repeat an issue I have already raised, other 'imported' technical approaches may realise other form of architectural space.

But Wigley's argument also raises another issue. What role does the background have if paper is no longer the surface on which the drawing is formed? What happens to the disciplinary boundaries of architecture if the line is not drawn but projected? If we consider a drawing no longer located on paper and instead imagine different ways of producing a line, we also may need to change the way in which we think about the status of a drawing and the drawn line. For example, in the world of digital media, animated drawings, computer programming and film, the background is a projection screen, or a series of screens or different forms. Perhaps

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[139] Wigley, 'Paper, Scissors, Blur', p. 33.
[140] Wigley, 'Paper, Scissors, Blur', p. 37.
[141] Wigley, 'Paper, Scissors, Blur', p. 28.
[142] Wigley, 'Paper, Scissors, Blur', p. 37.
[143] Wigley, 'Paper, Scissors, Blur', p. 37.
[144] Wigley, 'Paper, Scissors, Blur', p. 37.
[145] Wigley, 'Paper, Scissors, Blur', p. 37.
[146] Wigley, 'Paper, Scissors, Blur', p. 27.

lines can occur in any kind of discipline or space. Pursuing these questions may extend our conceptions of architecture and its primary tool, the line. What is of particular interest is how both theoretically and practically such a line may be described and achieved.

In the following final section of this chapter I return to these issues and those of the earlier discussions of Ingraham, Evans and Benjamin. I intend through the use of the philosophical ideas of Deleuze and Grosz to open up lines of inquiry that create a theoretical framework concerned with the mobility, materiality, immateriality and projection of the line.

Deleuze in his book *Cinema 1 The Movement-Image* offered me a different understanding of such a line. For Deleuze the 'image is matter: not something hidden behind the image, but on the contrary the absolute identity of the image and movement'.[147] For Deleuze 'the identity of the image and movement stems from the identity of matter and light' and he continues 'the image is movement, just as matter is light'.[148] Deleuze states that 'we may therefore say that the plane of immanence or the plane of matter is: a set of movement images; a collection of lines or figures of light; a series of blocs of space-time'.[149]

[147] Gilles Deleuze, *Cinema 1: The movement-image*, Hugh Tomlinson and Barbara Habberjam (trans.), (London: The Athlone Press, 1986), p. 61.
[148] Deleuze, *Cinema 1*, p. 62.
[149] Deleuze, *Cinema 1*, p. 63.

## 1.5: OPENING LINES OF ENQUIRY

Through Grosz's discussion of how the actual diverges from the virtual by 'forging modes of actualization that [...] transform this virtual into others unforeseen by or uncontained within it' [150] we have seen that in the process of 'forging' the line plays a pivotal role between the material and immaterial, between the actual and the virtual. As such a line containing the power of transformation may be a line of either conceptual or technical mobility, a mobility that can transform concepts and switch between techniques for making lines. Unusual forms of representations in architecture, like the abbreviated names and notes in drawing/writing, or the introduction of artistic approaches such as collage, may expand architectural conceptualization of the line, and allow the representation of embodied, subjective experience.

For me the investigation of the line in architecture follows a non-linear path between architecture and another allied discipline – in my case one I shall follow through the art of Paul Klee. I argue that the line's conceptual and technical mobility and the way the line is made are two crucial aspects that define the mobility of the line. For me, the line is not necessarily a drawn line that represents a wall or a structure, but may also be an immaterial line, a line of thought, a descriptive line of text or a projected line of an image.

Drawing on Deleuze and Guattari's conceptualizations of trajectories and lines and Grosz's ideas of the body I propose that we should look at the line's mobility as connective trajectories between art and architecture. I understand the mobility of the line to also be concerned with the inscription of corporality through which a line may acquire bodily properties. I find that in certain creative processes there is a convergence between the body and the line's conceptualizations, executions and performances. Such lines, as suggested by Deleuze, are mobile, as they move between the visual and the tactile in a creative process. Such lines may be regarded as embodied, and in relation to Grosz's arguments on subjectivity, may acquire various properties of the body – the line may walk, stop or be passive, or the line may be a mediator between two sides, states, positions and forms. Also such lines may possess materialities in which both matter and thought coexist and these lines, like the body, perform a function, have their own rhythm and their own dimension.

In relation to Evans's diagram of the creative process and my interest in this diagram from an observer-creator point-of-view I have described Deleuze and Guattari's ideas on searching multiplicities and divergence while not separating the representations, creation and experience from one another. I find that it may be possible to modify the concepts in Evans's diagram to allow the lines to connect in some way experience, the body in space and the lines of creative acts in some way. These lines or trajectories may take any form, material or immaterial, they may adopt elusive or associative forms of linearity, and also converge through

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[150] Elizabeth Grosz, *Architecture from the Outside: Essays on Virtual and Real Space*, (Cambridge, Massachusetts; London, England, 2001), p. 130.

the body in what Grosz calls 'vectors of becoming' that move towards the new, that transform and actualize the virtual into the real.

Benjamin's analysis of the potentiality of a diagram and Deleuze's ideas of deterritorialization, of movement as escape from a given territory, made me consider lines of movement which alluded to intensities which can move through and between events and through and between forms. For me, such a conceptualization of the line constitutes a point of departure from representative and illustrative modes of drawing, towards generative and productive forms. If in a diagram lines are forces of movement through which productivity becomes possible, they may also be regarded as vectors that involve time and that may allow for the productive intensity of the new and a future that is 'yet to come'.

Wigley's analysis of New Babylon, and more generally disturbing the background of the line prompted me to consider different background surfaces for a drawing. I decided then to look at the immaterial and temporal line as a line that has been 'taken for a walk' across its traditional boundary, paper, and into another space.

To conclude, I have realized that it is possible to re-consider Evans' diagram of the creative process. The process of design depicted in Evans' diagram *(Fig. 1.3)* is based on an understanding of drawing as a clearly represented material line on paper. Once we explore in detail other possible lines in terms of mobility, materiality, immateriality and projection we can consider how to alter Evans' diagram to account for the discovery of new lines with which we may be able to extend further the domain of the discipline of architecture.

## 2.0: THE MOBILITY OF THE LINE

> *The work as human act (genesis) is both a productive and receptive motion. Productive motion is within the manual limit of the worker (he only has two hands). Receptive motion is within the limit of the absorbing eye.*[1]

> *The father of the arrow is the thought [...] The thought as a medium between the earth and the world. The further the journey, the more delicate the tragedy for it to become movement, and not to be there already.*[2]

Throughout his career, Paul Klee experimented with motion. Numerous examples within a vast opus of paintings, drawings, sketches and writings were devoted to the line and movement. These are most comprehensively displayed in two posthumously published volumes of his notebooks: *The Thinking Eye* and *The Nature of Nature*, edited by Jurg Spiller. For Klee, line and movement seem to have been inseparable.

By suggesting that 'Klee clearly belonged to the same church as Deleuze, seeing a world as infinite, incessantly re-created through a cosmic – earthly tension' John David Dewsbury and Nigel Thrift state that in Klee's view 'there are only "primordially mobile" things', and they explore this in relation to Gilles Deleuze's thought that 'there is only movement'.[3] Focusing on what they call 'conceptual space' which they see as 'haunting' the 'actual world' and which can only be perceived through 'sensation', they understand an artist's art as 'a conduit, translator and creator of the virtual, immanent and open'.[4] I wish to investigate this idea of conceptual space by taking one particular artist's mode of expression, Klee's line and its movement.

In the creative process, as Gilles Deleuze writes, a painter negotiates his or her artistic moves by negotiating between 'the sensing' and 'the sensed', between, in the creative process of actualization, the hand and the eye.[5] A conceptual space lies between the eye and the hand, one of continuous negotiation and movement, in which there is an exchange between the sight and touch. To understand this mobility, **Section 2.1: Between Tactile and Visual Intuitions – Movement**, focuses on the exchange between optical and tactile intuitions that are present in the creative process of Klee's work, his thinking and practice. This understanding relies on Deleuze's notion of 'the sensing' and 'the sensed' and feminist philosopher Elizabeth Grosz's

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[1] Paul Klee, *Pedagogical Sketchbook [Pedagogisches Skizzenbuch]*, Neue Bauhausbucher, (trans.) Kathrin Hassold, (Berlin: Gebr. Mann Verlag, 1997), p. 23.
[2] Klee, *Pedagogical Sketchbook*, p. 44.
[3] John David Dewsbury and Nigel Thrift, '"Genesis Eternal": after Paul Klee', *Deleuze and Space*, Ian Buchanan and Gregg Lambert (eds.), (Edinburgh: Edinburgh University Press, 2005), p. 92.
[4] Dewsbury and Thrift, 'Genesis Eternal', p. 93.
[5] Gilles Deleuze, *Francis Bacon: the logic of sensation*, Daniel W. Smith (trans.), (London: Continuum, 2004). See chapters: 'Painting and Sensation', pp. 34-44, 'Painting Forces', pp. 56-65, 'The Diagram', pp. 99-111 and 'The Eye and the Hand', pp. 154-62.

notions of 'embodied vision'. Grosz's *Volatile Bodies* considers 'embodied subjectivity' which, among other things, she suggests is a way of resisting dualism of various kinds like mind/body, inside/outside, form/matter and so on.[6] Grosz understands body as 'the threshold or borderline concept that hovers perilously and indecisively at the pivotal point of binary pairs'.[7] For me, Grosz's conceptualizations of the body offer a way of looking at often-assumed binary opposition between sight and touch. I argue that in a creative process there is simultaneity between visual and tactile intuition and that this simultaneity involves continuous mobility and exchange between the two. I argue that this exchange happens through the body.

Klee's own concern with the mobility of the line is expressed in many examples, but is perhaps most evident from his own categorization of the line as 'active', 'passive' or 'middle' lines. Each of these three lines demonstrates the way a body might walk. In other words, for Klee, the existence and movement of a line can be compared to a bodily act. Grosz's argument in *Volatile Bodies* is concerned with how subjections are conceived by reconfiguring the body and her suggestion is that subjectivity can be explained through the subject's own corporeality.[8] Grosz's understanding of subjectivity offers new readings of Klee's active, middle and passive lines, and this is discussed in **Section 2.2: The Active, the Middle and the Passive Line**.

Klee distinguishes a particular kind of line whose origin he finds in natural growth as a 'mediating line'. For Klee, this line is conceptually located at a crossover between natural processes, processes in the body and abstract geometrical processes of formation. This line is a crossover, a point between an actual moment, in time and moments that are yet to come.

Grosz links the 'actual' and the 'virtual' to movement, she sees movement as occurring between the concepts of life and time, which further both occur through the 'process of actualization'.[9] Grosz develops her conceptualizations of 'actual' and 'virtual' in relation to Deleuze and Bergson's understandings of movement and time, and links them to the 'process of actualization and innovation'.[10] Klee's 'mediating' line is a crossover between virtuality and actuality; it is a movement of the process of actualization between an instant in the process of transformation from one form to another. The 'mediating' line, for Klee, involves time and duration, which are inseparable aspects of the line's mobility. This aspect of the line's mobility is discussed in **Section 2.3: The Mediating Line**.

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[6] Elizabeth Grosz, 'Refiguring Bodies', *Volatile Bodies: Toward Corporeal Feminism*, (Bloomington and Indianapolis: Indiana University Press, 1994), pp. 3-24.
[7] Elizabeth Grosz, 'Refiguring Bodies', pp. 3-24.
[8] Elizabeth Grosz, 'Refiguring Bodies', pp. 3-24.
[9] Elizabeth Grosz, *Architecture from the Outside: Essays on Virtual and Real Space*, (Cambridge, Massachusetts; London, England: The MIT Press, 2001), pp. 109-30.
[10] Grosz, *Architecture from the Outside*, pp. 109-30.

## 2.1: BETWEEN TACTILE AND VISUAL INTUITIONS – MOVEMENT

The visibility of the world, and how the artist may see the world – in terms of both optical and non-optical ways of seeing, was of great concern to Klee. One of Klee's most famous statements was that 'artists efforts are directed to making the "real truth" visible', since 'art does not reproduce the visible, but makes visible'.[11] For Klee, to make this visibility happen, a relationship between the artist and the world has to be established. Klee states that: 'I and you, the artist and his object, seek to establish optical-physical relations across [the] invisible barrier between the "I" and the "You"'.[12] He suggested that while the development of a purely optical sight produced excellent pictures, 'the art of contemplating unoptical impressions and representations and making them visible was neglected'.[13] Klee's concerns were particularly in the domain of abstract art, as opposed to traditional representational art. Klee believed that the 'artist of today is more than an improved camera',[14] and that the artist's engagement with the world should be a complex one, involving a subjective theory of space concerned with the wandering viewpoint, optical and non-optical ways of seeing, and the inseparability of the body and visibility.

By defining visibility as that which exists beyond the 'hegemony' of the eye, Klee regarded 'tactile intuition' as part of his visual thinking. In his work on line and movement, Klee suggested that the line 'is a matter of measure alone' and 'its use depends on length (long or short), angles (obtuse or acute), radial and focal length' all properties that Klee suggests 'can be measured'.[15] However, Klee in his 'analysis of movement' links the idea of measuring of the line in relation to movements suggesting that 'the natural progression of the lengths and thicknesses of lines and their intervals' is a visual strategy where lines can demonstrate movement in a painting.[16] Klee further suggested that 'the proportions of the lines characterize the varying progress of movement; the intervals indicate measure of time' in which case 'each progression results in a spatial factor'.[17] Klee understood the measure of the line to indicate both space and time, further suggesting that 'the movement takes on a definite character when the basic design is both visible and locally defined as the measure of structural repetition'.[18]

In the *Paul Klee Notebooks Volume 1: The Thinking Eye* and *Paul Klee Notebooks Volume 2: The Nature of Nature* (the posthumously published opus of pedagogic writings

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[11] Christian Geelhaar, *Paul Klee and the Bauhaus*, (Bath: Adams and Dart, 1973), p. 26.
[12] Paul Klee, 'Ways of Nature Study' *Paul Klee Notebooks, Volume 1, The Thinking Eye*, Jurg Spiller (ed.), Ralph Manheim (trans.), (London: Lund Humphries; New York: George Wittenborn, 1961) pp. 63-7, 63.
[13] Klee, 'Ways', p. 63.
[14] Klee, 'Ways', p. 63.
[15] Paul Klee, ' Survey and orientation in regard to pictorial elements and their spatial arrangement', *Paul Klee Notebooks, Volume 1, The Thinking Eye*, Jurg Spiller (ed.), Ralph Manheim (trans.), (London: Lund Humphries; New York: George Wittenborn, 1961), pp. 81-96, 86.
[16] Paul Klee, 'Analysis of movement', *Paul Klee Notebooks, Volume 1, The Thinking Eye*, Jurg Spiller (ed.), Ralph Manheim (trans.), (London: Lund Humphries; New York: George Wittenborn, 1961), pp. 218-9, 218.
[17] Klee, 'Analysis of movement', p. 219.
[18] Klee, 'Analysis of movement', p. 219.

consisting of essays, notes, diagrams, sketches, drawings, investigations and paintings produced during his painting and teaching career in the Bauhaus 1919 – 1931) Klee went on to develop the most important aspect of his theory of art – movement.[19] For Klee 'movement underlies the growth of all things' and is expressed in a threefold way: 'the initial impulse in ourselves, the production of the work itself, and, the communication of the work across to others, to the beholders – these are the main stages of the creative act: conceiving, creating, imposing the creating'.[20] Concerned with creative processes, Klee suggested that in the process of visual creativity, 'there is the non-optical way of intimate physical contact, earthbound, that reaches the eye of the artist from below, and there is the non-optical contact through the cosmic bond that descends from above'.[21]

Klee's ideas lead us to consider how artists see the relationship between optical and non-optical, or tactile, intuitions in the creative processes and, in particular, in relation to line and movement. Furthermore, understanding the relationship between Klee's optical and non-optical ways of seeing, sheds light on the creative process itself, and on Klee's concern with the mobility of the line.

For Klee, the movement in relation to the line is a way of considering the relationship between the impulse the artist might have in activating a line, the kind of line the artist might produce and the properties displayed by such lines. For me such relationship considers 'mobility' between the initial impulse, the creation of a line and the particularity of the resultant line operates between 'the sensing' and 'the sensed'.[22] 'Sensing', for Klee, was a 'journey' through the experience of the world while the 'sensed' in his view was an artistic interpretation of that world which was 'not to produce the visible' but to 'make visible'. [23]

Deleuze, in discussing painting, suggests that, 'I experience the painting only by entering the painting, by reading the unity of the sensing and the sensed'.[24] What Deleuze is suggesting, in terms of experiencing a painting, expressed similarly in Klee's own words at the beginning of *Creative Credo*, requoted by Deleuze in *Francis Bacon: The Logic of Sensation*: 'the task of painting is defined as the attempt to render visible forces that are not themselves visible'. [25] The unity of the sensing and the sensed suggested by Deleuze, in relation to Klee's own practice, involves combining tactile and optical experiences of the world and the abstraction of such an experience into art. For Klee, 'a certain fire flares up; it is conducted

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[19] Paul Klee, 'Creative Credo', *Paul Klee Notebooks, Volume 1, The Thinking Eye*, Jurg Spiller (ed.), Ralph Manheim (trans.), (London: Lund Humphries; New York: George Wittenborn, 1961), pp. 76-80.
[20] Paul Klee, 'Graphic art', in Christian Geelhaar, *Paul Klee and the Bauhaus*, (Bath: Adams and Dart, 1973), p. 29.
[21] Klee, 'Ways of Nature Study', p. 66.
[22] For the discussion on the relationship between the 'sensing' and the 'sensed' see 'Painting and Sensation', Gilles Deleuze, *Francis Bacon: The Logic of Sensation*, (London; New York: Continuum, 2004), pp. 34-44.
[23] Klee, 'Creative Credo', p.76.
[24] Deleuze, *Francis Bacon*, p. 35.
[25] Deleuze, *Francis Bacon*, p. 56.

through the hand, flows to the picture and there bursts into a spark, closing the circle whence it came: back into the eye and further (back to one of the origins of movement, of idea)'.[26]

Although Klee's approach suggests a clear distinction between vision and touch and this is evident in many aspects of his work, there are also connections between the two. For example, in his diagram of visual thinking *(Fig. 2.1)* Klee distinguished on one side of this diagram the 'Eye' and the 'I' (both representing the artist) and on the other side of this diagram 'Visible intensity' and 'You' (both representing the object). Between Eye – I and Visible Intensity – You appearance flows into the Eye via what Klee calls an 'optical-physical way'.[27] From above and below flows of non-optical influences come into the Eye. Klee called these influences from below 'terrestrial roots' and he saw them as 'static'. Those from above were for him influences of 'shared cosmic continuity' and 'dynamic'.[28] By positioning the Eye – I (the artist) in this way, Klee saw both static and dynamic influences coming to the artist from outside of the eye's focus. At the same time by suggesting that 'non-optical ways' contribute to the artist's vision, Klee declared that these non-optical ways, both from above and from below the usual eye's focus, contribute to the artist's vision and the production of actual images. Through these 'non-optical ways', the influences and intensities that enter the body of the artist extend the field of the visual to include the tactile.

In my view it seems that Klee is trying to depict in his diagram the relationship between the artist and the object in terms of exchanges of optical and non-optical ways of seeing. Such exchanges signal Klee's concern with 'non-optical ways'. I suggest that we can connect this concept of a non-optical way to Deleuze's understanding of sensation, since Deleuze understands exchanges between the body of the artist and the world as occurring through sensation. For Deleuze, 'sensation has one face turned toward the subject (the nervous system, vital movement, "instinct", "temperament" [...] and one face turned toward the objects (the "fact", the place, the event)'.[29]

When Klee discusses his concerns with the phenomenological constraints of this non-optical way of looking, he declares that 'we are led to the upper ways [dynamic] by yearning to free ourselves from earthly bonds'.[30] Klee sees these 'earthly bonds' as 'static' and linked to gravity.[31] For Klee, any artistic creation is an attempt to transgress the limit of gravity, to see beyond earth-bound statics and to yearn instead towards the cosmic, metaphysical and the ideal, suggesting, metaphorically, that the artist's role is 'to stand despite all possibility of

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[26] Klee, 'Creative Credo', p. 78.
[27] Paul Klee, '"I" – "YOU" – "EARTH" – "COSMOS"' (translated by author from original text in the diagram '"ICH" – "DU" – "ERDE" – "WELT"'), *Paul Klee Notebooks, Volume 1, The Thinking Eye*, Jurg Spiller (ed.), Ralph Manheim (trans.), (London: Lund Humphries; New York: George Wittenborn, 1961), p. 67.
[28] Klee, '"I" – "YOU" – "EARTH" – "COSMOS"', p. 67.
[29] Deleuze, *Francis Bacon*, p. 34.
[30] Klee, 'Ways of Nature Study', p. 67.
[31] Klee, 'Ways of Nature Study', p. 67.

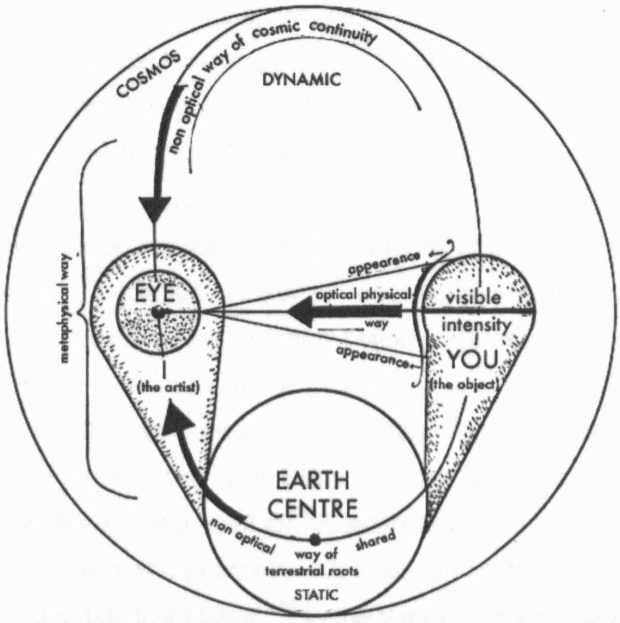


Fig. 2.1. Paul Klee, *' "I" – "YOU" – "EARTH" – "COSMOS" '*, (trans.) author from original text in the diagram *["ICH" – "DU" – "ERDE" – "WELT"]*, rpt. in *Paul Klee Notebooks, Volume 1, The Thinking Eye*, Jurg Spiller (ed.), Ralph Manheim (trans.), (London: Lund Humphries; New York: George Wittenborn, 1961), p. 67.

falling'.[32] Klee's desire to transcend gravity, statics and fixity takes place through what he calls 'pure mobility'.[33]

However, in order to understand and achieve such mobility in his own practice and which I shall later discuss in terms of the line, Klee starts with an analysis of bodily orientations in three-dimensional space. Klee suggests that 'the "I" orients itself in space according to three dimensions' and 'it judges its position in this space according to the concepts: above-below, left hand-right hand, in front-behind'.[34] Klee sees space to have tonal qualities: everything directed towards the air and above moves towards white, while everything directed towards the ground tends towards black. Klee makes a link between colour qualities and the positioning of the body in space by attributing a change in color (or tone) to the positioning of the body. *(Fig. 2.2)* The above or head is white, the below or foot is black, while grey is located in the middle *(Fig. 2.2)*. By positioning the body within the three dimensions of an imaginary cube, Klee allocates the tone or weight of a colour according to the position of the body and its relation – closeness or distance – from the force of gravity. In this way Klee has not only located his thinking within Euclidian space as the starting point for his art theory, but has also declared a very clear interest between painting and geometry. Klee called this diagram *(Fig. 2.2)* 'synthesis of objective body and subjective space'. [35] In the diagram, Klee positioned the body as a pivot and a torsion where the above, below and middle of space could be seen as a tonal transition. In my view such transitions can be considered as mobile as the body.

In his drawing techniques, however, Klee aimed to make analogies between the movement of the body and natural cycles of life. For Klee, there was 'no merit to drawing in proper perspective' as he believed that a perspectival understanding of space fundamentally differed from what he considered to be spatial in drawing or painting. This is because for Klee, 'the value of the whole process [perspective] lies solely in the possibility of checking'.[36] The process of perspective drawing was simply then for Klee a method of checking measurements from a vanishing point, and, therefore, in his view, it was easy – 'anyone can do it'.[37]

Klee thought that the creation of space in drawing or painting could be achieved through different means, through tone, colour and line. Klee suggested a different optical way of creating vision that consisted of displacing the single view of the static observer in the perspective. For Klee 'the position of the "I" changes from left to right, thus displacing the visual

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[32] Klee, 'Ways of Nature Study', p. 67.
[33] Klee, 'Ways of Nature Study', p. 67.
[34] Paul Klee, 'Orientation on the Surface and in Space; Articulation of the Pictorial Whole', *Paul Klee Notebooks, Volume 1, The Thinking Eye*, Jurg Spiller (ed.), Ralph Manheim (trans.) (London: Lund Humphries; New York: George Wittenborn, 1961), pp. 39-46, 44.
[35] Klee, 'Orientation', p. 44.
[36] Paul Klee, 'The horizontal', *Paul Klee Notebooks, Volume 1, The Thinking Eye*, Jurg Spiller (ed.), Ralph Manheim (trans.), (London: Lund Humphries; New York: George Wittenborn, 1961), pp. 141-9, 149.
[37] Klee, 'The horizontal', p. 149.

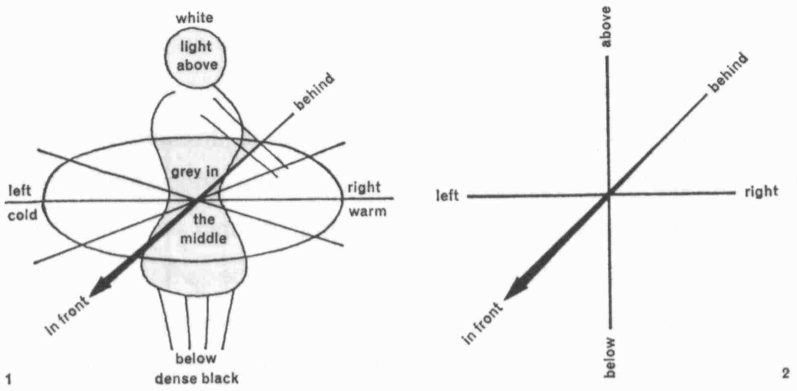


Fig. 2.2. Paul Klee, *Synthesis of objective body and subjective space,* rpt. in *Paul Klee Notebooks, Volume 1, The Thinking Eye*, Jurg Spiller (ed.), Ralph Manheim (trans.), (London: Lund Humphries; New York: George Wittenborn, 1961), p. 44.

point'.[38] Later he continues, by saying that 'this shift of the visual point results in movement and countermovement'.[39] In this respect, for Klee, 'the eye follows various stimulus points, on the basis of which the space is limited by points of various distance'.[40] Through experiments with shifting viewpoints Klee developed a number of conclusions on the problem of perspective. From these experiments he drew a basis for the figuration of movement.[41]

Klee's abstraction of the phenomenological constraints of the body in space in this diagram is described as his 'subjective theory of space', where the eye adopts a wandering rather than static viewpoint.[42] Klee worked with what he called 'combined operations', in which there is a 'multi-dimensional simultaneity of projections'.[43] For Klee, this meant that to achieve a 'shifting viewpoint' in the picture, a number of conditions were required: 'contrasting viewpoints due to movement of the spectator', 'change in the relation between heights', and 'alternation of downward and upward' views.[44] For Klee projection meant that 'the viewpoint is not strictly static: it is displaced a little and the object moves along'.[45] Using his strategies of what he called combined operations, and understanding projection not to be static, Klee aimed at production of a work that deviated from pure central perspective.

Klee suggested that the simultaneity of different projections was a way of deviating from the single viewpoint of traditional perspective. However, his own work on the simultaneity of projections depicts only part of the artist's vision, even while it aims at harmony and unity of the pictorial field. Klee acknowledges that in order to produce unity from a variety of projections one needs to take few steps. The first step for Klee was 'a regular deviation based on projection' which meant the mobility of viewpoint.[46] The next step would be to 'displace the object' in which there would be the mobility of the object as 'the object moves along'.[47]

Klee saw the possibilities of representation through the methods of constructing a central perspective using a single motionless visual point as limited. He believed that to depict a synthetic vision it was necessary to depict a variety of things at once. This strategy could be achieved by moving either the object or the observer. Klee suggested three ways to deviate from the pure central perspective of the observer. First, this could be achieved by 'deviating progressions', by creating movement along the path of vision;[48] second, by moving the

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[38] Paul Klee, 'The shifting vertical', *Paul Klee Notebooks, Volume 1, The Thinking Eye*, Jurg Spiller (ed.), Ralph Manheim (trans.), (London: Lund Humphries; New York: George Wittenborn, 1961), pp. 139-40, 140.
[39] Klee, 'The shifting vertical', p. 140.
[40] Klee, 'The shifting vertical', p. 140.
[41] Klee, 'The shifting vertical', p. 140.
[42] Klee, 'The horizontal', pp. 141-2.
[43] Klee, 'The horizontal', pp. 141-2.
[44] Klee, 'The horizontal', p. 142.
[45] Paul Klee, 'Synthesis of spatio-plastic representation and movement', *Paul Klee Notebooks, Volume 1, The Thinking Eye*, Jurg Spiller (ed.), Ralph Manheim (trans.), (London: Lund Humphries; New York: George Wittenborn, 1961), pp. 151-5, 153.
[46] Klee, 'Synthesis', p. 153.
[47] Klee, 'Synthesis', p. 153.
[48] Klee, 'Irregular projection', p. 155.

vanishing point or 'deviating [the] position of the vanishing point';[49] and finally, through producing a 'deviating perspective (and building boxes and building blocks)'.[50] For Klee these three moves were 'organic processes' that achieved 'deviations from the rules (of perspective)' and whose changes of scale depended on the distance from the beholder. These organic processes also included displacing objects so that they appeared to move – accentuating or omitting certain parts of objects to produce an effect of 'irregular projection'.[51] These deviations introduced by Klee provided, in his opinion, provided 'freedom into movement and movement into freedom'.[52]

In my opinion, Klee's method suggests a particular philosophical view of the relationship between space and the body. Rather than conceiving space as lying outside the body of the observer as in pure central perspective, Klee suggested that through 'combined operations and projection in different positions' a deviation from pure central perspective allows space to be seen not as singular, but multiple, and relative to the body. For Klee, his new method of 'irregular projection' was achieved by using 'organic combinations of the main forms of perspective', allowing for an 'interpenetration of space and body'. [53] According to Klee, the 'organic combination of the main forms of perspective' allows for three things: the 'interpenetration of space and body', 'simultaneous inner and outer form' and 'representation according to essence and appearance'.[54]

The visual strategies that allow this interpenetration of body and space to happen, according to Klee, are depictions of 'simultaneous, multi-dimensional phenomena', 'multi-dimensional contacts' and 'more complex structures'. [55] For example, in his watercolor *Town Square Under Construction,* (1923) *(Fig. 2.3)* Klee simultaneously combines plan, perspective, front and side views. In *Room Perspective Red/Green*, (1921) *(Fig. 2.4)* and *Uncomposed in Space*, (1929) *(Fig. 2.5)* Klee uses what he calls 'the plumb line' which corresponds to shifting the spectator's position from 'x' to 'x', therefore resulting in a distortion of the perspectival construction. The plumb line, according to Klee, is a vertical line in the painting 'that we ourselves stood where it stands'[56], while 'the horizontal means eye level'.[57] According to Kudielka, on Klee 'far from becoming locked in a coherent illusion', in Klee's work 'our vision adopts a "wandering viewpoint"'.[58]

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[49] Klee, 'Irregular projection', p. 155.
[50] Klee, 'Irregular projection', p. 155.
[51] Klee, 'Synthesis', pp. 152-5.
[52] Klee, 'Synthesis', pp. 152-5.
[53] Klee, 'Irregular projection', p. 155.
[54] Klee, 'Irregular projection', p. 155.
[55] Klee, 'Irregular projection', p. 155.
[56] Paul Klee, 'Perspective', *Paul Klee Notebooks, Volume 1, The Thinking Eye*, Jurg Spiller (ed.), Ralph Manheim (trans.), (London: Lund Humphries; New York: George Wittenborn, 1961), pp. 133-38, 137.
[57] Klee, 'The horizontal', p. 147.
[58] Robert Kudielka, '"With the appropriate means" - Klee's teaching at the Bauhaus 1921-31', *Paul Klee: The Nature of Creation/ Works 1914-1940* (London: Hayward Gallery and Lund Humphries, 2002), pp. 79-85, 81.

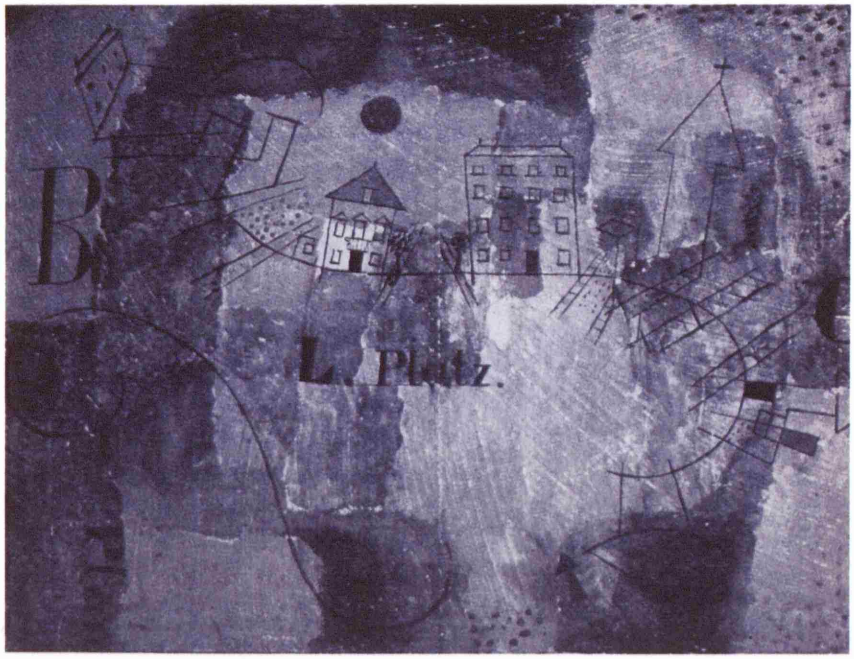


Fig. 2.3. Paul Klee, *Town square under construction*, (1923), watercolour, Staatliche Kunstsammlungen des Landes Nordrhein-Westfalen, Dusseldorf, rpt. in *Paul Klee Notebooks, Volume 1, The Thinking Eye*, Jurg Spiller (ed.), Ralph Manheim (trans.), (London: Lund Humphries; New York: George Wittenborn, 1961), p. 153.

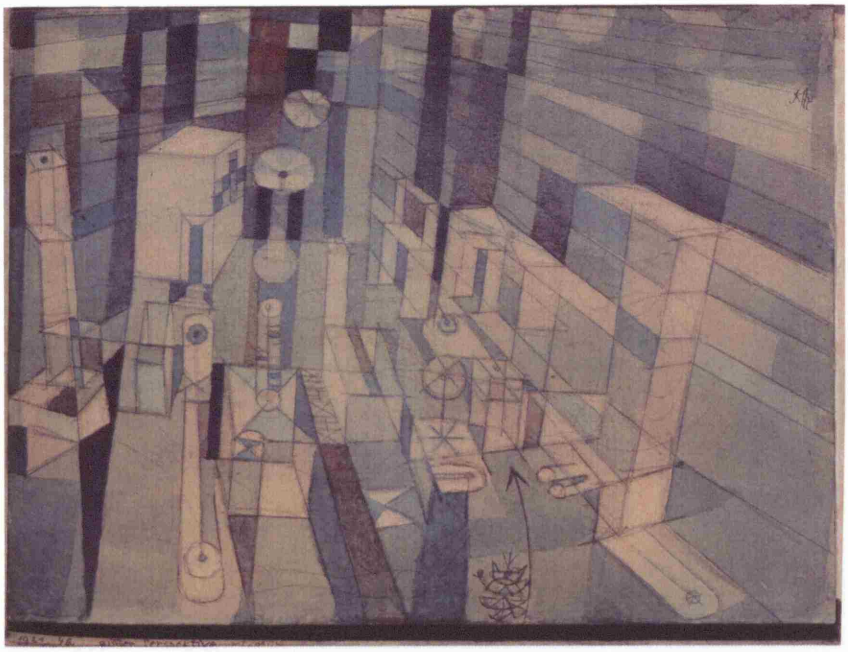

Fig. 2.4. Paul Klee, *Room perspective red/green,* (1921), watercolour, ink and pencil on wove paper mounted over India ink on paper strips, mounted on card 20x26.4 cm, Norton Simon Museum, Pasadena, CA, rpt. in *Paul Klee: The Nature of Creation/Works 1914-1940*, (London: Hayward Gallery in association with Lund Humphries, 2002), p. 87.

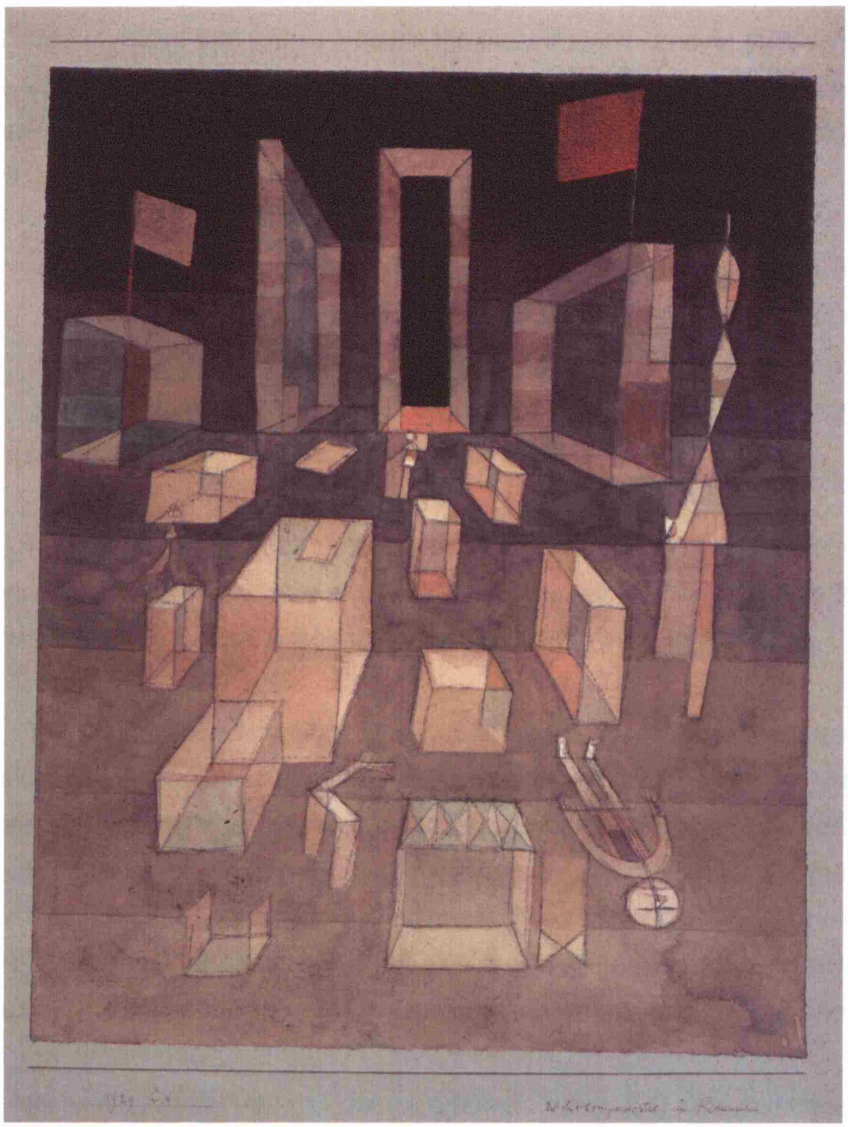

Fig. 2.5. Paul Klee, *Uncomposed in space*, (1929), watercolour, pen, chalk and pencil on paper mounted on card 31,7x24,5 cm, private Collection Switzerland, photo: Peter Lauri, Bern, rpt. in *Paul Klee: The Nature of Creation/Works 1914-1940*, (London: Hayward Gallery in association with Lund Humphries, 2002), p. 74.

Klee's concern with the depiction of the simultaneity of projections and multi-dimensional contacts, together with his desire to describe and depict the interpenetration of space and body, show his aim to redefine the relationship of body and space by extending the potential of perpectival forms for representing space visually. As critic Robert Kudielka states: 'In "making visible" Klee revealed that what we see in the picture plane is never purely visual, but includes factors such as gravity and the position of our own body'.[59] The world for Klee is composed of a simultaneiety of various experiences and forces that enter and leave the body and these are all present in different forms of movement:

> *And now: what a modern man experiences as he walks across the deck of a steamer: 1. his own movement, 2. the movement of the ship which may be in opposite direction, 3. the direction and velocity of the current, 4. the rotation of the earth, 5. its orbit, 6. the orbits of the moons and planets around it. Result: an interplay of movements in the universe, at their centre the 'I' on the ship.*[60]

In stating the inseparability of the body from the forces of nature in his teaching, and in his work on verticals, horizontals and wandering viewpoints, Klee proposes the inseparability of movements in the universe, although he still locates the body at its centre.

The connection of the body to the world and to nature is for Klee essential to his understanding of space. For him, 'everything (the world) is of dynamic nature' and he says later that, 'our faltering existence on the outer crust of the earth should not prevent us from recognizing this'.[61] Klee suggested that our own body, when examined at the microscopic level beyond the 'outer shell', is dynamic in essence, consisting of a growing 'primordial point' - an egg set in motion by fertilization.[62] As Klee claims, 'if we reduce our perspective to microscopic dimensions, we come once more to the realm of the dynamic, to the egg and the cell'.[63]

In his diagram of 'Ab-ovo-spatio-corporeal'[64] *(Fig. 2.6)* Klee depicts various domains of microscopic and macroscopic dynamic relations in which the only apparently fixed limit is the shell of the body. Everything inside the body is dynamic and everything outside the body is also dynamic. Klee uses the metaphor of an egg to describe inner space where the shell of the egg marks the limit of the body surrounded by space. There is movement in the inner space and also growth, represented by what Klee calls the 'primordial cell', which is 'set in motion by fertilization'.[65]

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[59] Kudielka, 'With the appropriate means', p. 81.
[60] Klee, 'Creative credo', p. 79.
[61] Paul Klee, 'Infinite natural history', *Paul Klee Notebooks, Volume 1, The Thinking Eye*, Jurg Spiller (ed.), Ralph Manheim (trans.), (London: Lund Humphries; New York: George Wittenborn, 1961), pp. 3-14, 5.
[62] Klee, 'Infinite', p. 5.
[63] Klee, 'Infinite', p. 5.
[64] Klee, 'Infinite', p. 6.
[65] Klee, 'Infinite', p. 6.

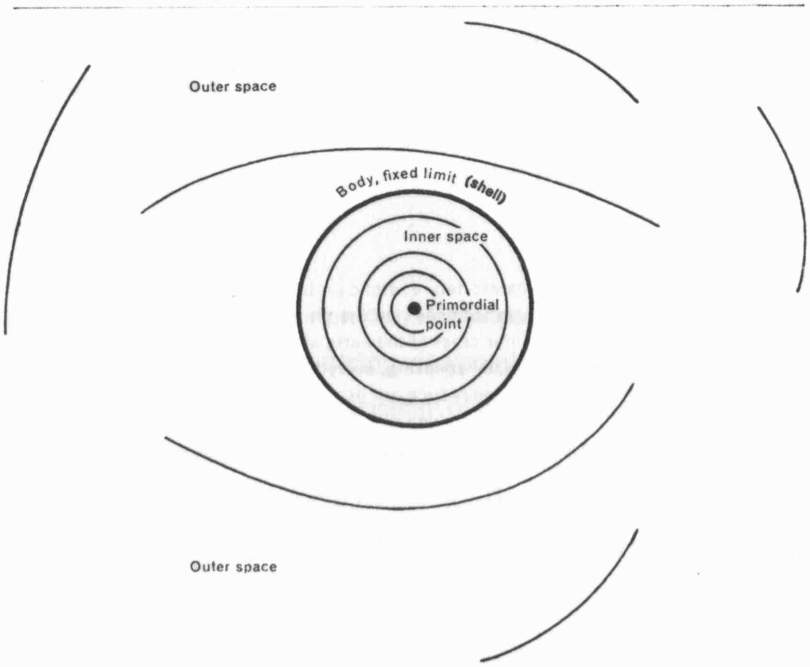


Fig. 2.6. Paul Klee, *'Ab-ovo'-spatio-corporeal,* rpt. in *Paul Klee Notebooks, Volume 1, The Thinking Eye*, Jurg Spiller (ed.), Ralph Manheim (trans.), (London: Lund Humphries; New York: George Wittenborn, 1961), p. 6.

So the shell of an egg, a metaphor for the skin of the body, is the only limit between inner space and outer space. Klee understands this relationship between the body and space in terms of: inside (inner space), limit (body shell) and outside (outer space).[66] These parts are inseparable and construct the whole. For Klee this whole is of a dynamic nature and is 'spatio-corporeo-spatial' which for Klee meant that the whole is 'spatial body in space'.[67] By suggesting that the relationship between the body and space is of dynamic nature, the skin of the body can be regarded as a pivot for the dynamic forces operating between the inside and the outside, a torsion point or a point of exchange between spatial and natural forces – a dynamic relationship set between the artist and the world.

Klee's concerns with the 'non-optical routes' that come to the eye of the artist from below and above, his work on wandering viewpoints and irregular projections can be seen, I suggest, in terms of torsion and the 'twisting' of the influences on the artist's vision and his body. Such tensions, according to Kudielka, were structural to Klee's creative practice and these he aimed to keep in dynamic balance. Kudielka suggests that Klee in order to keep dynamic balance tried to 'reconcile the frictions and dissonances within an enveloping tension'.[68]

For Klee a subjective theory of space considered wandering viewpoint and the mobile body and constituted ways of seeing the world that deviated from the central perspective of single static viewpoint. This theory, for Klee, opened up questions concerning the inseparability of the body and space. The theory suggested that the outside and inside of a body are in a dynamic tension and demonstrated this through examples of how to deviate from pure central perspective and achieve irregular projection. He showed in his diagrams the desire to bypass oppositional thinking and create a third tension-like connection that allowed the coexistence of inner space body and outer space. All these demonstrate that Klee's philosophical thinking has both a phenomenological (or what Klee called terrestrial, static and real) and a metaphysical (or what Klee called cosmic, dynamic and ideal) cast.

I would like to explore Klee's creative strategies in terms of their theoretical allegiance with the work of feminist philosopher Elizabeth Grosz. Grosz locates the exchange of the 'inside out' and 'outside in' of space as a precondition to any discussion of subjectivity. Klee's concern with what he calls a 'subjective' theory of space centres on the viewer as subject as 'I' and as 'Eye'. Klee sees subjectivity in terms of the subject or 'I' and vision or the 'Eye', but also in terms of the body, where the body is a threshold concept through which oppositional thinking can be discussed and where optical and non-optical ways converge. The representation of the body, with the vertical plumbline and horizontal eye level, his visual depiction of shifting viewpoints,

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[66] Jurg Spiller uses Will Grohman's translation of this diagram. See Will Grohman, *Paul Klee*, (London: Lund Humphries, 1954), p. 145, quoted in Klee, 'Infinite', p. 6.
[67] Klee, 'Infinite', p. 6.
[68] Kudielka, 'With the appropriate means', p. 83.

suggests that the interpenetration of inner and outer space happens through movement. Grosz's argument stresses that the 'indeterminable position of the body' hovers 'perilously and undecidably at the pivotal point of binary pairs'.[69] Klee's thinking on the indeterminacy of a body which is moving in space can be seen in a variety of exercises he suggests on how to shift viewpoints, and by his drawing technique involving multiple viewpoints and shifting objects which provide irregular projections in a picture. While Klee provides us with strategies for visual thinking, which involve the indeterminate position of the body in space, Grosz provides us with theoretical techniques for re-thinking the indeterminate position of the body conceptually.

Grosz suggests that although the sensory information can be provided by any of the sense organs she states that 'the surface of the body' is 'in a particularly privileged position to receive information and excitations from both the interior and the exterior of the organism'.[70] In her work on the porosity of the skin of the body she suggests that 'the information provided by the surface of the skin is both endogenous and exogenous, active and passive, receptive and expressive, the only sense able to provide the 'double sensation'.[71] For me Klee's paintings, which experiment with shifting viewpoints, mobility of the body and objects inside the painting make a connection to the viewer through this idea of a 'double sensation' both visually and through a skin-like touch. Klee's work when he deploys a strategy of shifting viewpoints to depict transparent, outlined objects, which seem to float in space displacing the subject from a static viewpoint, suggest the indeterminate position of the body in space and at the same time draw the body of the viewer to move through the painting space. According to Kudielka, examples such as: *Room Perspective Red/Green,* 1921, *(Fig. 2.4)* and *Uncomposed in Space*, 1929, *(Fig. 2.5)*, deliberately 'avoid bringing the perspectival indications to a finite resolution'.[72]

In my view both these examples demonstrate a lack of static single view-point; making objects transparent and deliberately altering the lines of the vanishing points for each object, positioning figures in the picture in lying or standing positions, and the use of careful colour grading aims to un-ground depicted objects and make them appear to be floating in space. The visual effects of such strategies on the viewer are also felt through the body in an almost skin-like touch since they pertain to the viewer's previous experiences of the objects in space that is tactile and not visual in nature.

It could be argued that Klee's work on techniques of simultaneous visual projections bears a close resemblance to the observer's position in space due to his/her mobility. Klee never left 'earthbound reality' to fly into the 'cosmos' [his metaphor]. What he wanted to achieve throughout his work was a depiction of the fluidity of everything in the universe. Klee gave primacy to neither optical nor to tactile intuitions but kept the two in tension. While working

[69] Grosz, *Volatile Bodies*, pp. 23-4.
[70] Grosz, *Volatile Bodies*, p. 35.
[71] Grosz, *Volatile Bodies*, p. 35.
[72] Kudielka, 'With the appropriate means', p. 81.

within the broader rules of perspective, Klee deviated from perspective by terms of multiplying and shifting viewpoints. Concerns with mobility rather than with the static nature of the body and with the multiplicity rather than the singularity of space, suggest in my view that Klee can be seen almost as a feminist painter concerned with influences and transitions between the inside and the outside of the body, creating his own subjective theory of space, and whose desire to bypass oppositions resulted in the search for different forms of visual mobility.

As a painter Klee aimed to bypass binary oppositions and instead a dynamic balance or tension. This approach resembles Grosz's theoretical critiques of binary oppositions of mind and body, which are, for her, 'frequently correlated with the distinctions between reason and passion, sense and sensibility, outside and inside, self and other'.[73] For Klee such binary oppositions can be kept in dynamic tension by moving between geometry and painting, idealism and materialism (or what he calls ideal or material statics), between rule and intuition, between visible appearances and invisible forces.

Klee's work and writing suggests that binary opposites can be kept in dynamic tension and related through movement; here line plays a crucial role. Grosz suggests that 'for Merleau-Ponty, the subject's relation to its own body provides it with basic spatial concepts by which it can reflect on its position', like 'form and size, direction, centredness (centricity), location, dimension, and orientation are devised from perceptual relations'.[74] For Grosz 'these are not conceptual impositions on space, but our ways of living bodies in space'.[75] Grosz later says that, 'they derive from the particular relations the subject has to objects and events' and 'their correlation with tactile and visual sensations forms the basic ideas of localisation and orientation'.[76] Klee's work 'in-between' tactile and visual intuition allows us to discuss spatial ideas of localization and orientation and as such proposes a different approach to geometry, painting through the mobility of the line.

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[73] Grosz, *Volatile Bodies*, p. 3.
[74] Grosz, *Space, Time and Perversion: Essays on the Politics of Bodies*, (New York and London: Routledge, 1995), p. 92-3.
[75] Grosz, *Space, Time and Perversion*, p. 93.
[76] Grosz, *Space, Time and Perversion*, p. 92-3.

## 2.2: THE ACTIVE, MIDDLE AND PASSIVE LINE

> *Shortly after application of the pencil, or any other pointed tool, a (linear-active) line comes into being. The more freely it develops, the clearer will be its mobility.*[77]

For Klee the line possesses the ultimate mobility in relation to other visual processes, or creative processes for producing visual works, such as point or surface, and is also the most basic of elements: 'at the dawn of civilisation when writing and drawing were the same thing, it was the basic element'.[78] But if it is with the discovery of the movement of a pencil on paper, the 'phenomenon of a mobile point', that the line comes to life.[79]

> *From point to line. The point is not dimensionless but an infinitely small planar element, an agent carrying out zero motion, i.e. resting. Mobility is the condition of change. Certain things have primordial motion. The point is cosmic, a primordial element. Things on earth are obstructed in their movement; they require an impetus. The primordial movement, the agent, is a point that sets itself in motion (genesis of form). A line comes into being. The most highly-charged line is the most authentic line because it is the most active.*[80] *(Fig. 2.7)*

Sibyl Moholy-Nagy, the wife of Laszlo Moholy-Nagy, and a teacher in the Bauhaus in the Preliminary Course with Klee (1923-1929), in her concluding note to Paul Klee's *Pedagogical Sketchbook*, outlined the 'Line in action' as a main concern of his work.[81] For Klee, she suggests the line was the 'point of progression', but it also featured in many other ways throughout his thinking, such as 'planar definition', 'mathematical proportion', 'coordinator for the path', 'line of motion', 'optical guide' and 'optical reason', 'psychological balance', 'energy projection', 'a symbol of centrifugal and centripetal movement', 'a symbol of will and infinity' and 'a symbol of colour and kinetic harmony'.[82] Such an extensive list of the definitions of the line indicates the diverse role of the line in Klee's own experimentation. The common feature that all these possibilities outline explicitly or implicitly is the line's connection with movement.

When Klee was working and drawing, he would start with a pencil and an impulse to set it in motion.[83] According to Kudielka 'this way of working seems to be extraordinarily close to the

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[77] Paul Klee, 'Line: active, middle and passive', *Paul Klee Notebooks, Volume 1, The Thinking Eye* Jurg Spiller (ed.), Ralph Manheim (trans.), (London: Lund Humphries; New York: George Wittenborn, 1961), pp. 103-16, 103.
[78] Klee, 'Line: active', p. 103.
[79] Klee, 'Line: active', p. 103.
[80] Klee, 'Line: active, middle, passive', p. 105.
[81] Sibyl Moholy-Nagy,'Concluding Note', *Pedagogical Sketchbook*, (intro.) and (trans.) Sibyl Moholy-Nagy (London: Faber and Faber, 1968), no page no.
[82] Sibyl Moholy-Nagy, *Pedagogical Sketchbook*, no page no.
[83] Klee, 'Line: active', p. 103.

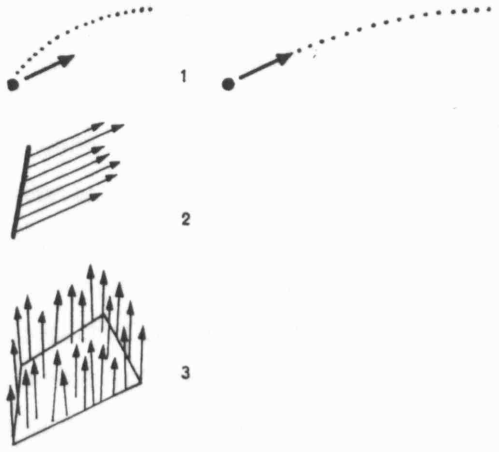


Fig. 2.7. Paul Klee, *Point – line – surface – movement*, (described in text and shorthand by author), rpt. in *Paul Klee Notebooks, Volume 1, The Thinking Eye*, Jurg Spiller (ed.), Ralph Manheim (trans.), (London: Lund Humphries; New York: George Wittenborn, 1961), p. 103.

Surrealist "psychic automatism", as christened by Andre Breton in 1921'.[84] However, unlike the surrealists, Klee 'never referred to the "unconscious", so dear to Breton's understanding of automatism'[85] As Kudielka says later, 'it was the unintentional approach that was crucial to his drawing'.[86] Kudielka suggests that Klee's drawings should not be looked at in terms of 'subjectivity' as they 'reveal that far from being driven by the intention to characterize, to describe or even formalize something, Klee started out with nothing but the point of his pencil and the impulse to set it in motion'.[87] In addition, Kudielka suggests that there is a particular connection for Klee between drawing and speaking. Kudielka claims that if we take into account Klee's classical education we can connect his line to the grammar of ancient Greece, in which a middle voice exists between the active and passive that 'is used for all those actions that are neither actively directed nor passively endured, such as "appearing", "speaking", "dancing"'. Kudielka makes the connection between the voice and line for Klee quoting some of these explanations from *Paul Klee Notebooks Volume 1 The Thinking Eye* claiming that 'drawing as the movement of a point "that sets itself in motion" can be seen as such middle voice'.[88]. To support this claim he refers to what Klee said to his own students when teaching at the Bauhaus: 'at the root, word-making and form-building are the same thing'.[89]

So Kudielka argues against understanding Klee's work in terms of subjectivity, preferring to consider the work in terms of 'unintentionality'.[90] He also separates Klee's work from the Surrealist way of working, specifically automatic writing, and discusses Klee's line in terms of its relation to the middle voice of ancient Greek narrative. This view provides an interesting insight into Klee's work. Nonetheless some points need to be carefully considered.

To further understand the relationship between unintentionality and subjectivity, I would like to look at Grosz's suggestion about the relationship between the body and lived reality. Relying on Merleau-Ponty, Grosz states that the body 'is defined by its relations with objects and in turn defines these objects as such – it is a "sense-bestowing" and "form-giving"'.[91] This double relationship between the body and lived reality in which there is a continuous exchange between the two in my mind makes it difficult to separate subjectivity and unintentionality. Although Kudielka, referring to Klee, suggests that word-making and form-building are the same thing, it does not necessarily follow that we should equate Klee's line with the narrative or middle voice in ancient Greek. If we think of this in terms of Klee's own claims for the dynamic

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[84] Robert Kudielka, '"The Point set in motion" – the narrative line between fantasy and construction', *Paul Klee: The Nature of Creation/ Works 1914-1940*, (London: Hayward Gallery and Lund Humphries, 2002), pp. 53-6, 53.
[85] Here Kudielka refers to an understanding of automatism as a "dictation of unconscious" and translates Breton's "automatisme psychique" from the *Manifest of Surrealism* of 1924 and published in Andre Breton, *Ouvres completes*, Marguerite Bonnet (ed.), 3 vols, (Paris, 1988), vol.1, p. 328. See Kudielka, 'The Point set in motion', p. 54.
[86] Kudielka, 'The Point set in motion', p. 54.
[87] Kudielka, 'The Point set in motion', p. 53.
[88] Kudeilka, 'The Point set in motion', pp. 53-4.
[89] Klee, 'The concept of artistic creation', *Paul Klee Notebooks, Volume 1, The Thinking Eye*, (ed.) Jurg Spiller (trans.) Ralph Manheim, (London: Lund Humphries; New York: George Wittenborn, 1961), p.,17.
[90] Kudielka, 'The Point set in motion', p. 53.
[91] Grosz, *Volatile Bodies*, p. 87.

nature of the whole, and the inner space of the body as dynamic and connected with outer space, the line for Klee is the movement, through which the projection of the body happens.

For Klee, the line can be defined in terms of three types of movement: a line can be active, middle or passive.[92] The active line or 'linear-active' is a line that takes a path that occurs 'from point to line'.[93] This is 'the most highly-charged line' and also 'the most authentic line because it is most active.' Such a line 'goes for a walk, so to speak, aimlessly for the sake of the walk'.[94] *(Fig. 2.8)* The middle line or 'linear-medial' is a line where 'at the beginning it is linear, the movement of a point'; and where it 'ends by looking like a plane'.[95] Klee concludes that a 'medial line [is] where the 'planar effect' is 'obtained by circumscribed lines'. [96] This is a line which 'is short of time' and 'wants to get to 1, then to 2, then to 3, etc. as quickly as possible' and this Klee sees 'more like a series of appointments than a walk'[97] *(Fig. 2.9)* Finally, the passive line or 'linear-passive' is a line that becomes a plane; it is the line that 'works as a planar element'.[98] Klee says that in the linear passive 'we still see lines but not linear acts', and, in addition, 'what we see are linear results of planar actions', in other words actions that constitute surface.[99]

In his analysis of the line, Klee clearly attributes action to the line. Without movement or action a line is no longer a line. The difference between an active, middle, or passive line is distinguished by the form of action that the line displays. The line in Klee's work is not only an artistic tool for representation, but it acquires multiple philosophical and theoretical properties. We have seen, for example, in Klee's shifting viewpoints, that the line is a projection of the body. We have also seen, in Klee's work on active lines where point is set in motion, that the line implies bodily action and motion.

In the first definition of a line ('linear-active') Klee seems to give primacy to the role of intuition and immediate impulse in the artist's body. This is what he means when he talks of taking his 'line for a walk'. This is the first impulse he achieves when moving a pencil on paper. To move a pencil and create a line demands a complex relationship between the eye and the hand in which at that moment of moving the pencil, a bodily projection occurs through the motion of the hand. The complex process of interaction that occurs between the eye and the hand at such a moment of action is part of the relationship between tactile and visual intuitions in a creative process. The relationship between the eye and the hand and the orders of

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[92] Klee, 'Line: active, middle, passive', *Paul Klee Notebooks, Volume 1, The Thinking Eye*, (ed.) Jurg Spiller (trans.) Ralph Manheim, (London: Lund Humphries; New York: George Wittenborn, 1961), pp. 103, 109-120.
[93] Klee, 'Line: active', p. 105.
[94] Klee, 'Line: active', p. 105.
[95] Klee, 'Line: active', p. 109.
[96] Klee, 'Line: active', p. 109.
[97] Klee, 'Line: active', p. 109.
[98] Klee, 'Line: active', p. 115.
[99] Klee, 'Line: active', p. 112.

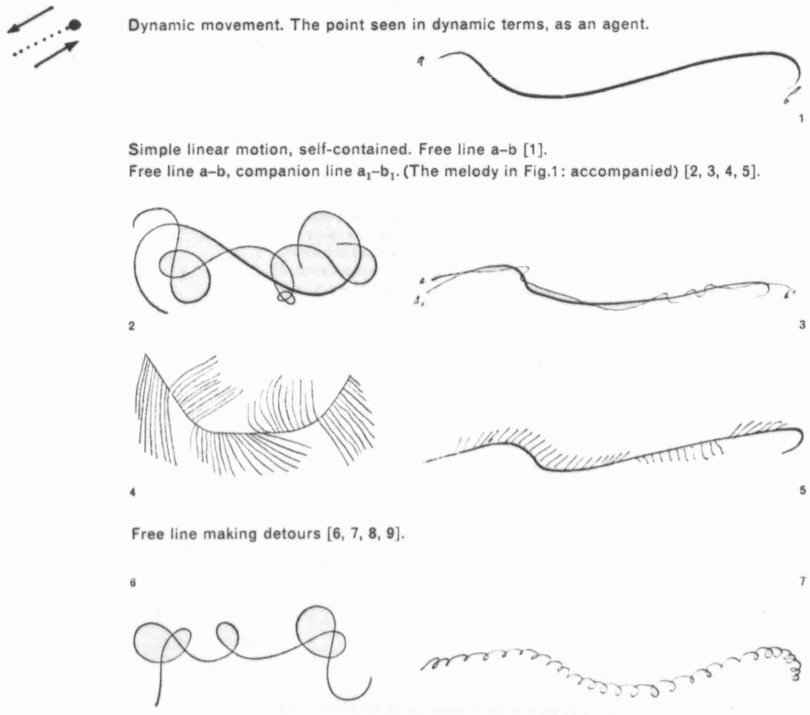
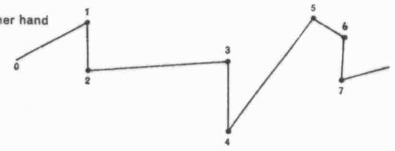



Fig. 2.8. Paul Klee, *Linear-active*, rpt. in *Paul Klee Notebooks, Volume 1, The Thinking Eye*, Jurg Spiller (ed.), trans. Ralph Manheim, (London: Lund Humphries; New York: George Wittenborn, 1961), p. 105.

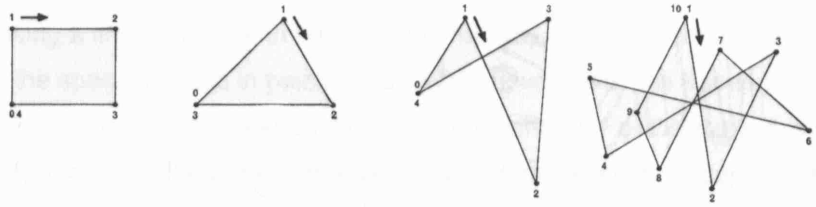
Active line
This new line on the other hand




is short of time, wants to get to 1, then to 2, then to 3, etc. as quickly as possible. More like a series of appointments than a walk. This is shown by the straight stretches. But both the free and the hurrying line are purely active types.
The linear tension of the straight stretches (most active line) is discharged between the points of tension lying on the path. (Dualism = static. •——• The straight lines are the quintessence of the static.)

**Linear-medial**

Neither line nor plane, but some sort of middle thing between the two. At the beginning it is linear, the movement of a point; it ends by looking like a plane. A medial line: planar effect obtained by circumscribed lines.




The line determined by few points. Time is of the essence.
In these examples the hurrying line circumscribes plane figures like the triangle and square.
The energies that move a line are the result of forces working in different directions.
Tension is connective.

*Cf.* p.368, 1927/i 1: *Many-coloured lightning.* Oil.

Fig. 2.9. Paul Klee, *Linear-medial*, rpt. in *Paul Klee Notebooks, Volume 1, The Thinking Eye*, Jurg Spiller (ed.), Ralph Manheim (trans.), (London: Lund Humphries; New York: George Wittenborn, 1961), p. 109.

movement between the two that take place in the process of painting is visually complex, and here the question that could be posed is: 'what guides the line, the eye or the hand?'

According to Deleuze, 'to describe the relationship of the eye and the hand, and the values through which this relationship passes, it is obviously not enough to say, the eye judges and the hands execute'.[100] For Deleuze, in the process of painting, the relationship between the eye and the hand 'pass[es] through dynamic tensions, logical reversals and organic exchanges and substitutions'.[101] As such, four aspects of the hand can be distinguished in this relationship: the digital, the tactile, the manual proper, and the haptic.[102]

For Deleuze, the digital (or finger-like) aspect is the 'maximum subordination of the hand to the eye': 'vision is internalized, and the hand is reduced to the finger'.[103] In this first impulse, in the process of painting, the eye guides the fingers. The fingers, or the brush held by fingers, move in an instinctive way creating shapes and contours, or what Klee would call 'linear acts', taking a line for a walk in an unintentional way, almost in an aimless way. Even in its early stages, the space created in paintings by such movements has traces of the tactility of the hand, as it is the hand that experiences relief or contour. For Deleuze, this digitally created 'optical space [...] still presents manual virtual referents (such as depth, contour, relief, and so on)', which he calls 'tactile referents'.[104] For Deleuze such 'tactile referents' are visually recognizable spatial referents. Klee, on the other hand, calls these first tactile movements 'actions'.[105] For Deleuze, tactile referents are traces of past bodily actions, while for Klee actions imply a forward projection of the body. However, both suggest bodily action. For Klee a bodily action is seen as an impulse, for Deleuze it is seen as an after-effect.

Deleuze discusses how once the initial impulse, guided by the eye, is executed by the hand, what is imposed on the eye is 'this space without form and a movement without rest, which the eye can barely follow'.[106] This becomes a problem for the eye as it 'dismantles the optical',[107] and at 'this movement without rest' the relationship between the eye and the hand changes, and the 'manual' takes over. [108] In Klee, this moment of transition, which Deleuze might understand as a moment where the optical has been 'dismantled' by the manual, corresponds to the moment the line is no longer aimless, (but for example, where 'appointments' are made on its walk), here it becomes a middle line. Finally, the line might take a passive mode and create a planar effect, a surface that pertains to touch. This is, Deleuze

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[100] Deleuze, *Francis Bacon*, p. 154.
[101] Deleuze, *Francis Bacon*, p. 154.
[102] Deleuze, *Francis Bacon*, pp. 154-5.
[103] Deleuze, *Francis Bacon*, p. 155.
[104] Deleuze, *Francis Bacon*, p. 155.
[105] Klee, 'Line: active', p. 103.
[106] Deleuze, *Francis Bacon*, p. 155.
[107] Deleuze, *Francis Bacon*, p. 155.
[108] Deleuze, *Francis Bacon*, p. 155.

might suggest, 'when sight discovers in it a specific function of touch that is uniquely it's own, distinct from its optical function'.[109]

The passage from digital to manual to haptic in the process of painting is not a one-way relationship then but full of reversals and repetitions, according to Deleuze. A line can start as active, transform to passive and then become active again. What is important in the transformation from line to plane or in the reversibility of such a process is that the relationship between the eye and the hand changes continuously. This is what Deleuze describes as a process of 'movement' and 'reversibility', in which 'one might say that painters paint with their eyes, but only insofar as they touch with their eyes'.[110]

According to Deleuze, the relationship between the eye and the hand is also concerned with sensation and with the projection of the artist's ego.[111] What the artist has in mind and what he or she might bring out from the world into a painting is something not easily measurable or visible. In Klee's words 'art does not reproduce the visible but makes visible'[112] while Deleuze suggests that 'the task of painting is defined as the attempt to render visible forces that are not themselves visible'. [113] To achieve this, 'to render visible', many artists have tried to understand the nature of such invisible forces and to discover how to make them visible or 'known'. For Klee, making visible happens through process of formation as he suggests that 'the way to form [...] is higher than its own end and goal'.[114] For Klee movement, line and formation are the ways not to reproduce the visible but to make visible.

But there is another aspect to be considered in the processes of formation and making visible. As Deleuze suggests, 'in art, and in painting as in music, it is not a matter of reproducing or inventing forms but of capturing forces'.[115] Deleuze states that many artists recognize the importance of capturing forces and the relation of this to sensation. For example, Deleuze comments on the novelist D.H. Lawrence's discussion of the painter Cezanne, thought that 'color is in the body, sensation is in the body, and not in the air'.[116] Deleuze further states that and 'sensation is what is painted' which for Deleuze is 'the body, not insofar it is represented as an object, but insofar as it is experienced as sustaining this sensation (what Lawrence speaking of Cezanne, called 'the appleyness of the apple")'.[117] Deleuze further states that 'as Valery put it, sensation is that which is transmitted directly, and avoids a detour and boredom of conveying

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[109] Deleuze, *Francis Bacon*, p. 155.
[110] Deleuze, *Francis Bacon*, p. 155.
[111] Deleuze, *Francis Bacon*, p. 155.
[112] Klee, 'Creative credo', p. 76.
[113] Deleuze, *Francis Bacon*, p. 56.
[114] Klee, 'Synthesis', p. 169.
[115] Deleuze, *Francis Bacon*, p. 56.
[116] Deleuze, *Francis Bacon*, p. 35.
[117] Deleuze, *Francis Bacon*, p. 35.

the story'.[118] Taking these examples, the question that Deleuze poses is: 'what is the relationship between sensation and force?'[119]

For Deleuze, 'force is closely related to sensation: for a sensation to exist, a force must be exerted on a body, on a point of the wave'.[120] However, 'if the force is the condition of sensation, it is nonetheless not the force that is sensed, since sensation 'gives' something completely different from the forces that condition it'. [121] For example in discussing the painter Millet, Deleuze suggests Millet did not paint a sack of potatoes on the back of a peasant but 'the force of that weight' or, and in relation to Cezanne, that Cezanne did not paint mountains but 'the folding force of mountains' or 'the germinative force of a seed', while Van Gogh painted the 'unheard-of force of a sunflower seed'.[122]

Deleuze, however, recognizes that for the painter there is a visual strategy involved in the process of capturing such forces. This visual strategy is concerned with how such forces get captured through the 'decomposition and recomposition of effects'.[123] Deleuze argues that in Renaissance art, the visual strategy was concerned with 'decomposition and recomposition of depth', for Impressionism, the 'decomposition and recomposition of colour', and for Cubism, the 'decomposition and recomposition of movement'.[124] However, in the particular case of movement, Deleuze recognizes that in the process of decomposition and recomposition of effect, movement 'is an effect that refers both to a unique force that produces it, and to a multiplicity of decomposable and recomposable elements beneath this force'.[125] In other words, movement is the force, the effect and multiplicity of elements.

Although Klee does not discuss issues of movement and sensation philosophically, he demonstrates both in his writing and his diagrammatic sketches of the line an obvious interest in the energies that move a line and the effects of such movements. For Klee, the forces, movements and effects that lines produce are different for each type of line. The most primitive force is found in an active line in terms of the most basic energy and dynamic movement, where the point is 'seen in dynamic terms, as an agent' which 'sets itself in motion'.[126] By setting in motion the point becomes analogous to the primordial force of a body, or what Klee describes as movement from fertilization to outward motion. For Klee, 'the point is not dimensionless but an infinitely small planar element, and agent carrying out zero motion, i.e. resting',[127] the force in the point is something made of 'primordial movement', that allows for the line to come into being.

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[118] Deleuze, *Francis Bacon*, p. 36.
[119] Deleuze, *Francis Bacon*, p. 56.
[120] Deleuze, *Francis Bacon*, p. 56.
[121] Deleuze, *Francis Bacon*, p. 56.
[122] Deleuze, *Francis Bacon*, p. 57.
[123] Deleuze, *Francis Bacon*, p. 58.
[124] Deleuze, *Francis Bacon*, p. 58.
[125] Deleuze, *Francis Bacon*, p. 58.
[126] Klee, 'Line: active', p. 105.
[127] Klee, 'Line: active', p. 105.

According to Klee, through this 'primordial movement' is how the 'genesis of form' happens.[128] The point, an infinitely small planar element, once set in motion, and thereby constituting a line, develops a walk, at first aimlessly, but soon to take a variety of detours. For example, the line might interpenetrate itself, or, secondary lines might be created, which move around an imaginary main line. The line might take different points of rest as if on a variety of 'appointments' during its walk, and slowly circumscribe planes.

In addition, between themselves, the lines operate as 'form[s] of energy' in terms of tension and connection. For Klee such forms of energy are important aspects of the process of forming a line. Once drawn, according to Klee, lines create a dialogue between themselves, one that is visible to a painter. They start to share a magnetic energy and move towards, or stay separate from, each other. Here Klee sees the tension between elements as something that may result either in the connection or separation of such elements in the picture. Depending on the overall aim of the picture, either the connection or separation of such elements can be achieved through movement.

For Klee, a line is movement and movement is what determines whether a line is active, middle, or passive. There is, however, a continuous negotiation between activity and passivity through the tensions and connections between different and similar lines, between lines and the point, and between lines and the plane. For Klee, movement offers a multiplicity of conditions that have to be considered, such as, the underlying tensions between the line and the plane depending on the particularity of linear movements. For him, different linear movements produce different planar effects. In the case of a square, linear movement is achieved along the straight line that eventually becomes a square. However, in the case of a circle, the movement is rotational *(Fig. 2.10)*. In some cases, the energies that move the line can be the result of forces working in different directions, where the tension between these forces becomes a form of balance. There might also be flows of forces and energies between the line and the point, like in the example of a triangle given by Klee where 'the triangle came into being when a point entered into a relation of tension with the line and, 'following the command of its Eros, discharged this tension'.[129] *(Fig. 2.11)* Although Klee sees the line as an active character and the plane as a passive character, in some cases a plane can become mobile when 'it takes on a linear character' and the surface moves like a wave *(Fig. 2.12)*.[130]

Klee's work on the line considers the line as movement, as an active capturing force, capable of producing effects and multiplying elements. For Klee, the line is more than a graphic tool, it is a vehicle and force that transgresses boundaries between demarcations of form. His

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[128] Klee, 'Line: active', p. 105.
[129] Klee, 'Line: active', p. 113.
[130] Klee, 'Line: active', p. 113.

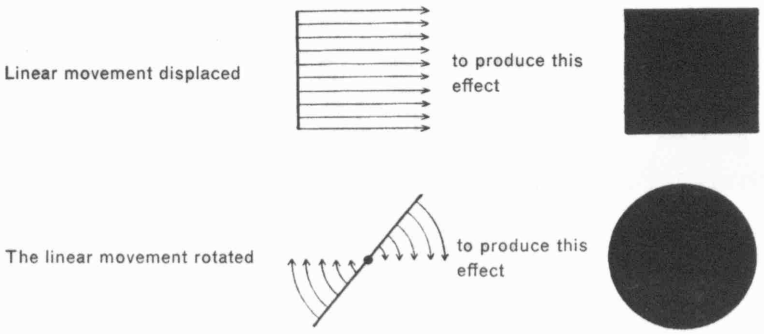


Fig. 2.10. Paul Klee, *Linear-passive*, rpt. in *Paul Klee Notebooks, Volume 1, The Thinking Eye*, Jurg Spiller (ed.), Ralph Manheim (trans.), (London: Lund Humphries; New York: George Wittenborn, 1961), p. 112.

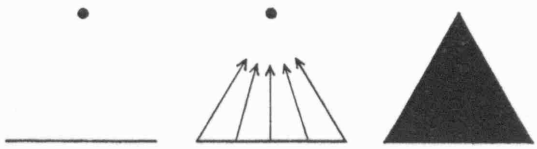

Fig. 2.11. Paul Klee, *Triangle – tension*, (described in text and shorthand by author), rpt. in *Paul Klee Notebooks, Volume 1, The Thinking Eye*, Jurg Spiller (ed.), Ralph Manheim (trans.), (London: Lund Humphries; New York: George Wittenborn, 1961), p. 113.

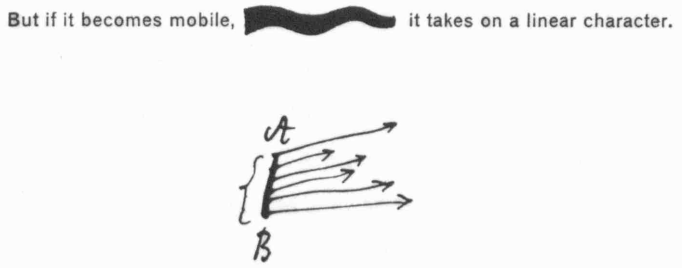


Fig. 2.12. Paul Klee, *Planar mobility*, described in text and shorthand by author), rpt. in *Paul Klee Notebooks, Volume 1, The Thinking Eye*, Jurg Spiller (ed.), Ralph Manheim (trans.), (London: Lund Humphries; New York: George Wittenborn, 1961), p. 113.

three characters of the line do not stand separately from each other, they flow into each other operating for example between active and passive modes. *(Fig. 2.13)* Activity and passivity exchange in a medial zone where the lines transform their characteristics in a way, which for Klee, using linguistic analogy can be described like this: 'Active: I fell: The man felled the tree with the axe'; 'Middle: I Fall: The tree fell with the man's last stroke' and 'Passive: I am felled: The tree lay felled'.[131] In other words, both through the line and through linguistic analogy with active and passive modes, Klee tries to bridge the demarcations, opposites and separations between subject and object that are to be transgressed through movement. Through the line as movement in Klee's work, forces and sensations become a series of continuous and discontinuous effects, compositions and decompositions that flow between the subject and object, the outside and the inside.

In my view such an understanding of the transgression of oppositions through the mobility of the line parallels more philosophical concerns with binary oppositions such as body and mind, inside and outside. As early as 1908 in his diary notes from Munich, Klee states his dissatisfaction with oppositions and his desire to bridge the gap between inside and outside: 'No sooner have I mastered that stage than nature bores me. Perspective makes me yawn. Should I now distort it? (I have already tried distortions in a mechanical way). How shall I most freely last a bridge between inside and outside?'[132]

Grosz (following Deleuze and Guattari) critiques these binary oppositions by arguing that 'subject and object are series of flows, energies, movements, strata, segments, organs, intensities-fragments capable of being linked together or severed in potentially infinite ways other then those which congeal them into identities'.[133] She goes on to say that such a 'production consists of these processes which create linkages between fragments, fragments of bodies and fragments of objects'.[134] In relation to Klee's work and the previous discussion of the line, we can understand that for Klee the line stands for a body taken for a walk. Such body-lines negotiate, create dialogues and enter into linkages and alignments along the path to formation.

For Grosz these 'disparate, discontinuous alignments or linkages brought together in conjunctions (x plus y plus z) or severed through disjunctions and breaks' are 'assemblages' or 'multiplicities' and they are 'composed of lines, of movements, speeds and intensities'.[135] Grosz further states that as 'they are essentially in movement, in action, are always made, not found'.[136] In other words they are 'consequences of a practice, whether it be that of the bee in

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[131] Klee, 'Line: active', p. 120.
[132] Paul Klee, 'Munich 1908', *The Diaries of Paul Klee 1898-1918*, Felix Klee (ed.) and (intro.), (Berkeley, Los Angeles, London: University of California Press, 1964), p. 228.
[133] Grosz, *Volatile Bodies*, p. 167.
[134] Grosz, *Volatile Bodies*, p. 167.
[135] Grosz, *Volatile Bodies*, pp. 167-8.
[136] Grosz, *Volatile Bodies*, pp. 167-8.

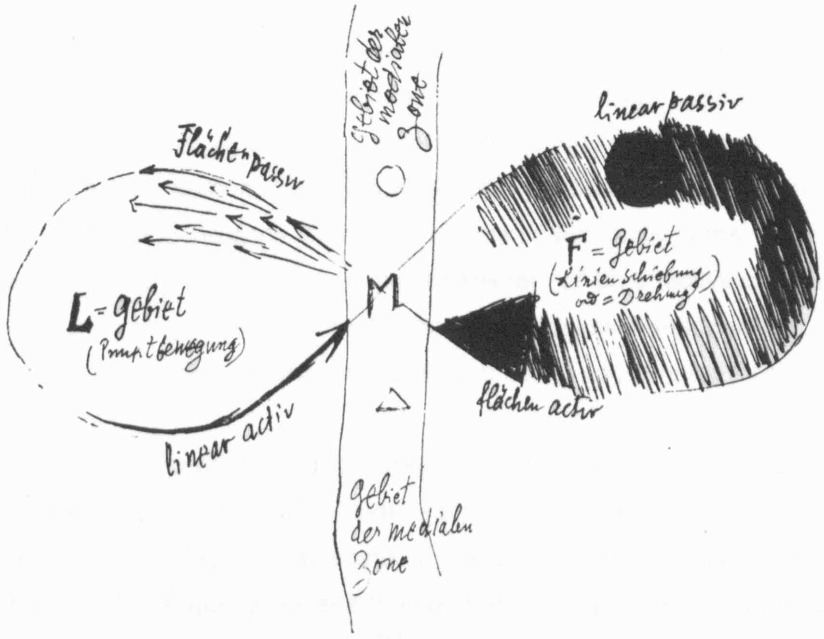


Fig. 2.13. Paul Klee, *Active, Middle, Passive: Summary*, (trans. by the author from original diagram), rpt. in *Paul Klee Notebooks, Volume 1, The Thinking Eye*, Jurg Spiller (ed.), Ralph Manheim (trans.), (London: Lund Humphries; New York: George Wittenborn, 1961), p. 120.

relation to the flower and the hive or of a subject making something using tools or implements'.[137] In relation to Klee's body-lines, the assemblages and multiplicities that such lines encounter on the path to formation depend on his particular practice and the visual strategies that he deployed.

For example, when Klee talks of 'convergence', he discusses choosing an example of a line 'suggesting a restful walk without definite aim or purpose'.[138] He compares such a line to a 'theme in a composition' in which 'this line had something restful, harmonious about it; if used as a theme in a composition, it would have favoured a treatment with accompanying forms'.[139] To such a 'resting line' he adds 'companion forms or substitute forms' which could be either additional lines of 'an absolute converging character', of 'an effective converging character', or 'effectively converging, while the companion line retains its independence'.[140] Klee compares such forms of convergence to the 'path of a man with a dog running free'.[141] *(Fig. 2.14)*

In his example of 'divergence', Klee suggests that compared to convergence, the essential difference would be 'to consider each line as a path of a man'.[142] He further states that 'in the previous examples we may speak of friendship; the companions never part'.[143] However, in the example of divergence 'we see the companion only once, running briefly across our path' and at a certain point along such path.[144] *(Fig. 2.15)*

In these examples of convergence and divergence we can see that practices concerned with movement involve continuous change. The corollary to change is transformation, this will be analysed in the following section.

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[137] Grosz, *Volatile Bodies*, p. 168.
[138] Klee, 'Line, plane, and orientation in space', *Paul Klee Notebooks, Volume 1, The Thinking Eye* Jurg Spiller (ed.), Ralph Manheim (trans.), (London: Lund Humphries; New York: George Wittenborn, 1961), p. 123.
[139] Klee, 'Line, plane', p. 123.
[140] Klee, 'Line, plane', p. 123.
[141] Klee, 'Line, plane', p. 123.
[142] Klee, 'Line, plane', p. 124.
[143] Klee, 'Line, plane', p. 124.
[144] Klee, 'Line, plane', p. 124.

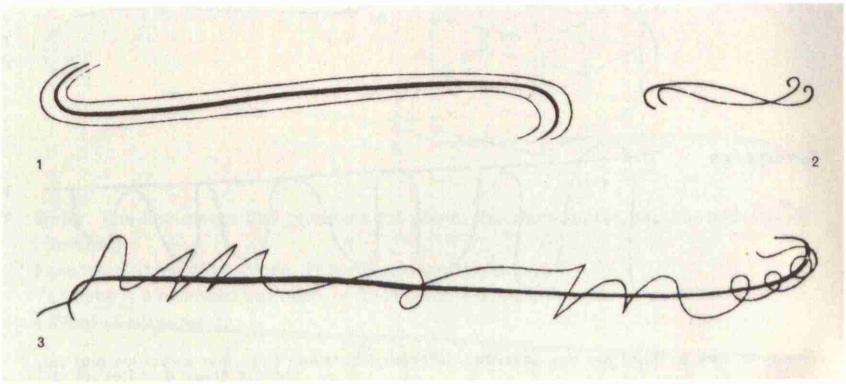


Fig. 2.14. Paul Klee, *Convergence*, rpt. in *Paul Klee Notebooks, Volume 1, The Thinking Eye*, Jurg Spiller (ed.), Ralph Manheim (trans.), (London: Lund Humphries; New York: George Wittenborn, 1961), p. 123.

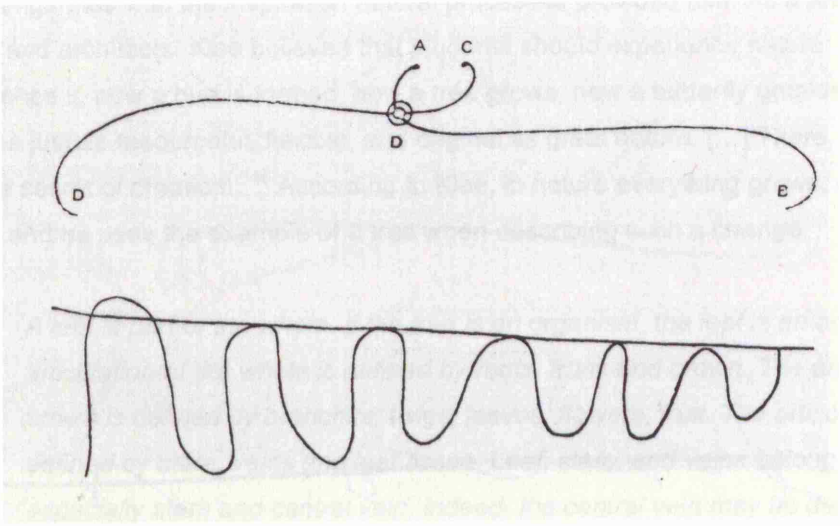


Fig. 2.15. Paul Klee, *Divergence*, rpt. in *Paul Klee Notebooks, Volume 1, The Thinking Eye*, Jurg Spiller (ed.), Ralph Manheim (trans.), (London: Lund Humphries; New York: George Wittenborn, 1961), p. 124.

## 2.3: THE MEDIATING LINE

Klee's understanding of the mediating line is concerned with the process of formation, and it originates with the inspiration natural processes provided him. As a teacher of future artists and architects, Klee believed that students should experience nature: 'Make them experience it, how a bud is formed, how a tree grows, how a butterfly unfolds, so that they may become just as resourceful, flexible, and original as great nature. [...] There, in nature's womb, lies the secret of creation'.[145] According to Klee, in nature everything grows, changes and alters shape and he uses the example of a tree when describing such a change:

> *A leaf is part of the whole. If the tree is an organism, the leaf is an organ [...] The articulation of the whole is defined by roots, trunk and crown. The articulation of the crown is defined by branches, twigs, leaves, flowers, fruit. The articulation of a leaf is defined by stem, veins and leaf tissue. Leaf, stem, and veins belong together, especially stem and central vein, indeed, the central vein may be described as a continuation of the stem. This whole line is thus divided into stem and continuation.*[146]

The line that Klee was defining is the structural line of the tree: movement happens through divisions and subdivisions, therefore creating parts that evolve into a whole. Klee states that 'this division of the main line of leaf stem to central vein, however, is not the only one' as 'new divisions ensue by the branching of new veins to the left and right' and Klee says later that 'the line is charged with force especially at the point where it must produce as many branchings as possible, namely at the beginning, close to the stem'.[147]

However, Klee states that his 'concept of the veins [of the leaf]' should be seen in terms of an interest which seeks to find the 'constructive, articulating forces' behind 'the evolution (in the pictoral sense) of a leaf' in order to consider this leaf 'as an argument between linear force or peculiarity and two-dimensional massiveness or multiplicity'.[148] Looking at nature as a painter, and one who is concerned with mobility of the line, Klee suggests that 'planar massiveness is the element that to the eye no longer appears linear, but is distinguished as a separate element by its tangle of lines'.[149] For Klee, in nature continuous forces articulate the whole, and make a tree grow, branch and multiply. However, Klee suggests that 'where linear power ends, there arises contour, the limit of planar form' and 'once traced, this limit figures also

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[145] Paul Klee's words quoted by Nohra Corredor, *The idea of "MOVEMENT" as the principle of Paul Klee's Art*, <http://www.ecologicalart.com/movinpaulkle.htm>, 2 February 2006.
[146] Paul Klee, 'Primary forces of form production, form-creating and form-articulating nature; Linear forces and planar form; Part and whole', *Paul Klee Notebooks, Volume 2, The nature of nature*, Jurg Spiller (ed.), Heinz Norden (trans.), (London: Lund Humphries, 1973), pp. 5-24, 5.
[147] Klee, 'Primary forces', p. 5.
[148] Klee, 'Primary forces', p.13.
[149] Klee, 'Primary forces', p.13.

as a line, but it takes a new character with the radiant energy of the interior line formations as its element'.[150]

Klee is trying to describe, in the example of the tree and the leaf, what he calls the 'figuration process'. This figuration process describes the phenomenon whereby, at a particular moment, form emerges from the veins of the leaf. In describing the 'sequence of stages' in his 'basic theory before figuration' Klee lists four elements. He starts with 'form', which for Klee is 'the formal element *per se*, elementary, as a static phenomenon'. Second, there is the 'act of forming', which 'must be based on primary process'. Third, there is a 'figuration example', which is a 'straightforward coincidence of forms, based on a process, e.g. a function'. The final element is the 'figuration process', described as a 'higher combination of formal elements and pictoral processes'.[151] Klee scholar Jurg Spiller further suggests that what Klee concludes from this sequence of elements is that the figuration process 'demonstrates the borderline where statics end and event passes into motion is indeed inconceivable without the mobile process'.[152]

If we consider that for Klee, 'the act of giving form determines form itself, and the process is more important than the form', we can understand that his analysis of the natural processes of growth and multiplication was conducted in order to be able to visually arrest such processes and demonstrate through a succession of drawings what he considered to be the line's mobility in such processes. Klee states that 'form must never and on no account be considered disposal, result, end product, but rather as genesis, essence growth'.[153] As Spiller in his 'Introduction' to *Paul Klee Notebooks, Volume 2, The Nature of Nature,* concludes, 'what really interested Klee were the processes of thinking and forming, and their functions, the act of forming in terms of living examples'. [154] In my opinion a process of movement that presents itself as series of moments that can be visually arrested involves time and this can demonstrate what Klee called 'the act of forming'. For Klee 'it is the act of forming rather than form itself, form in the process of growth, as genesis', [155] that is important in the process of growth from one static moment in time to another, for me, Klee's line becomes the gradual genesis of new forms in such a process, an active force that plays a crucial role in the mediation between two static ends.

Klee looked at nature as an endless source of abstract thinking and new geometrical experiments. For example, in inscribing a circle into the centre of a leaf Klee demonstrated the relationship between the radii created by the veins of the leaf and the radius of the inscribed

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[150] Klee, 'Primary forces', pp. 13-17.
[151] Jurg Spiller, 'Introduction', *Paul Klee Notebooks, Volume 2, The nature of nature*, Jurg Spiller (ed.), Heinz Norden (trans.), (London: Lund Humphries, 1973), p. 43.
[152] Spiller, 'Introduction', p. 43.
[153] Spiller, 'Introduction', p. 43.
[154] Spiller, 'Introduction', p. 43.
[155] Spiller, 'Introduction', p. 43.

circle. Different 'radii push the given area measurements beyond the normal limits', [156] *(Fig. 2.16)* while the radius of the inscribed circle was seen to push towards the centre, the veins of the leaf were seen as radial forces pushing outwards from the centre. In such a situation, where the relationship between the radius of a circle and the radii of the leaf are presented as being in tension, Klee suggests that 'the material between the radii is no longer sufficient and the borderline becomes deeply scalloped'. [157] It is exactly this 'borderline', the site of tension between opposing forces, that Klee calls, in many of his diagrammatic examples, the mediating line.

In the 'Figuration Example 51/7' *(Fig. 2.17)*, that Klee set for his students in 1923, he tried to demonstrate that instead of a single centre for the radius, several centres could be deployed, this he called the example of 'imaginary leaves on the basis of forgoing insight into basic rules [of formation]'.[158] This example was an attempt in his view of 'free geometric-aesthetic effort'.[159] What the 'Figuration Example 51/7' shows is how the borderline of a shape changes in relation to two sets of forces, those pushing outwards and those pushing inwards in different directions to the centre. The borderline shapes are outlines mediating between the inward and outward forces, stemming from the outward movement embedded in natural forms (leaf veins) and the inward forces embedded in a geometrical figure (the circle's radius).

Klee further elaborated on the nature of his 'mediating line' in a series of purely geometrical diagrams. His aim was to demonstrate that the process of formation is more important than a static, formal end. He used 'mediation' as an in-between, and what he called a 'crossover' between forms.[160] In the example of two triangles, one inscribed within the other, Klee drew 'rays' from the centre and by a 'halving of the rays', or taking an exact half measurement between the perimeters of one triangle and the other, he obtained a new line through such 'mediation'.[161] Using the 'halving the rays' strategy Klee experimented with simple forms like triangles inscribed in triangles, squares or circles; squares and circles inscribed in triangles; *(Fig. 2.18)*, and squares and triangles inscribed in circles. *(Fig. 2.19)* These numerous examples demonstrate Klee's aim to depict the process of transformation from one form into another and arrest such moments of transformation. The tool for such a process of transformation was Klee's 'mediating line'.

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[156] Paul Klee, 'Primary forces of form production, form-creating and form-articulating nature; Linear forces and planar form; Part and whole', *Paul Klee Notebooks, Volume 2, The nature of nature*, (London: Lund Humphries, 1973), p. 21.
[157] Klee, 'Primary forces', p. 21.
[158] Klee, 'Primary forces', p. 22.
[159] Klee, 'Primary forces', p. 22.
[160] Paul Klee, text from original drawings and notes from *Instruction Lessons by Paul Klee 10 [Unterricht Paul Klee]* on *Formations and Theory of Form [Gestaltungs und Formlelere],* (1930), Kathrin Hassold (trans.), (photo.) author, November 2005, (Berlin: Bauhaus ARCHIVE, Inv. Nr. 10365/59 - 87), p. 74.
[161] Klee, *Instruction Lessons by Paul Klee 10*, p. 74.

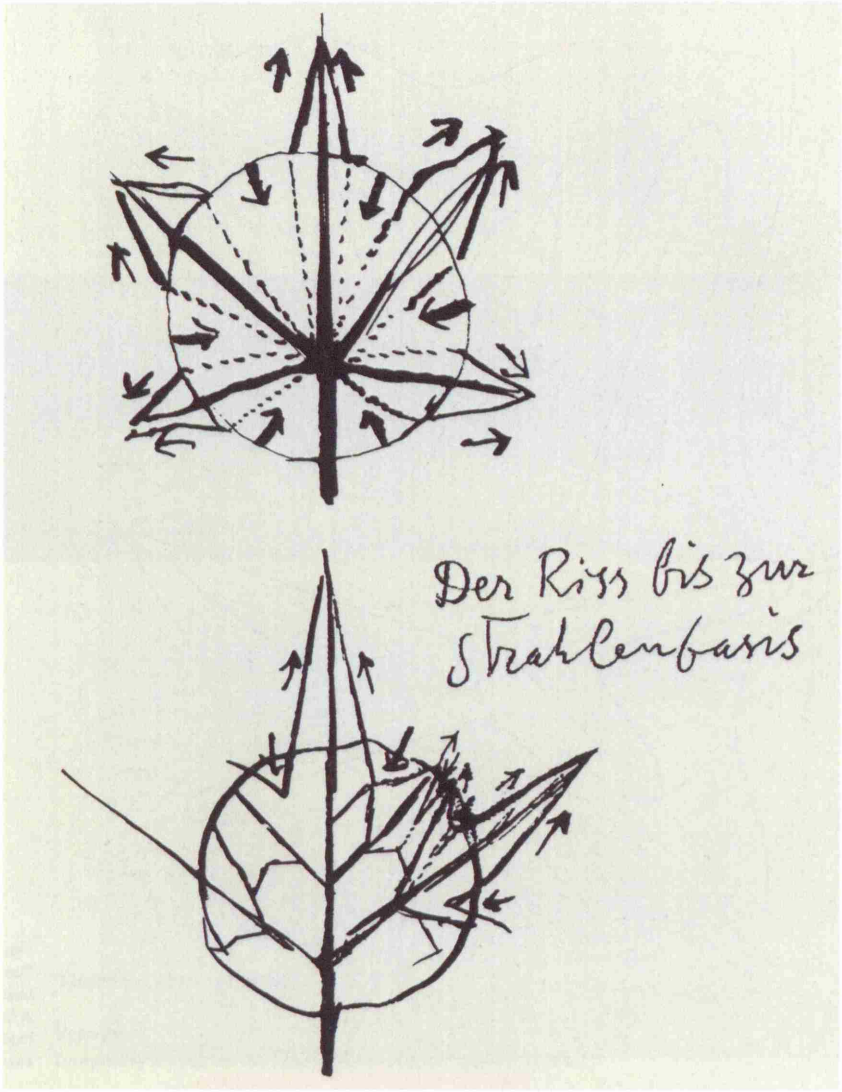


Fig. 2.16. Paul Klee, *Tear to the base of radii*, original sketch rpt. in *Paul Klee Notebooks, Volume 2, The Nature of Nature*, Jurg Spiller (ed.), Heinz Norden (trans.), (London: Lund Humphries, 1973), p. 21.

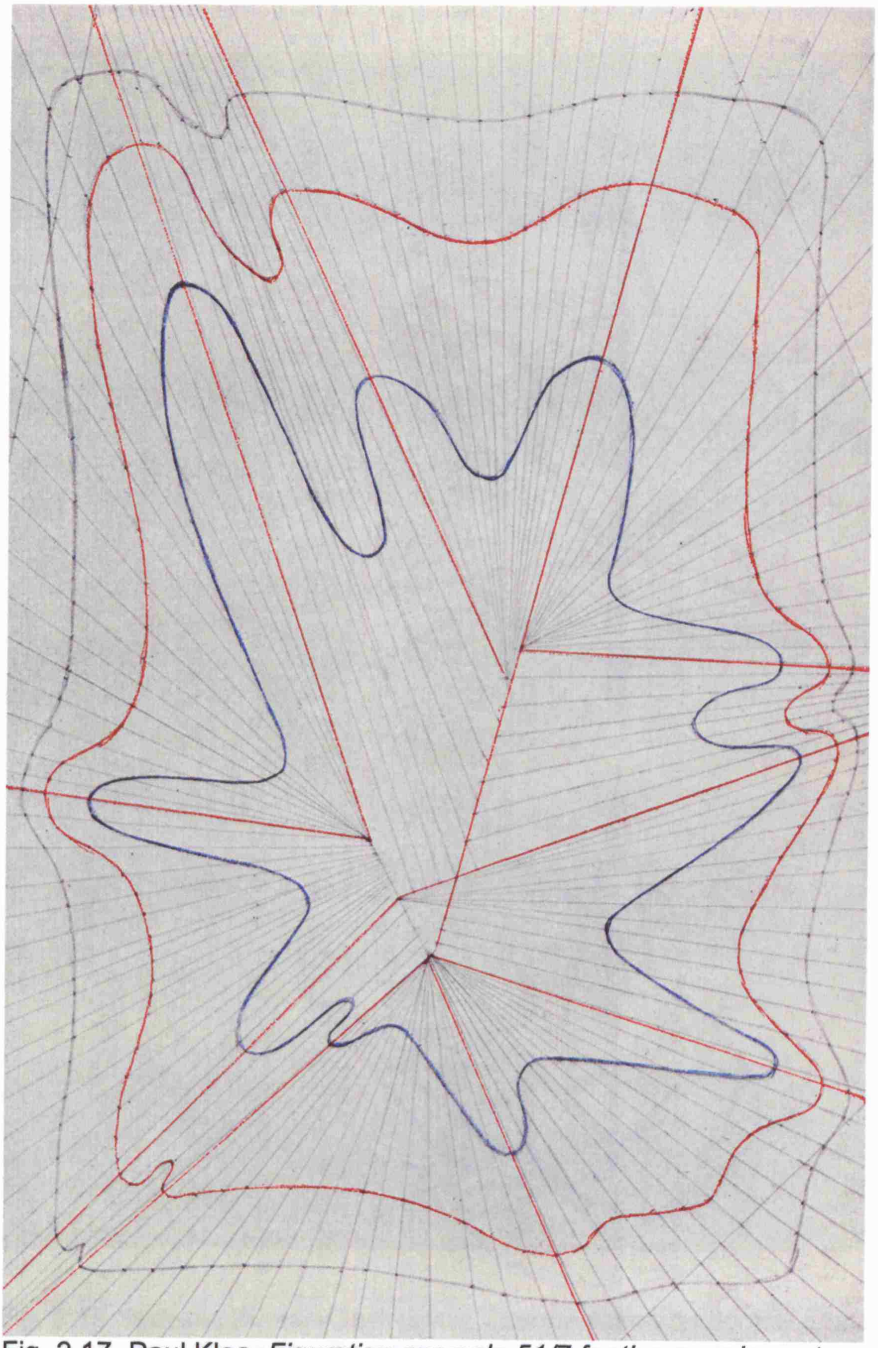

Fig. 2.17. Paul Klee, *Figuration example 51/7 for the exercise set on Tuesday, 30 October 1923*, original sketch rpt. in *Paul Klee Notebooks, Volume 2, The Nature of Nature*, Jurg Spiller (ed.), Heinz Norden (trans.), (London: Lund Humphries, 1973), p. 22.

In a more complex example, Klee experimented with repositioning the centre of the radii eccentrically, causing more complex shapes to be generated. *(Fig. 2.20)* He also experimented with a multiple halving of the rays, where at each point of 'halving' another form was generated. This process demonstrated Klee's never-ending search for an understanding of the processes of formation. In these examples, the line operates as a tool of mediation.

In the example of 'Intermediation' *(Fig. 2.21)*, mediation happens between 'the two mediate curves' that are generated 'with the raycentre in the back and in between' the figures.[162] In the 'Subtraction Example' *(Fig. 2.22)* 'intermediation between the two forms' happens 'by the construction of a central ray system' where for 'curve a' (the orange curve) the 'raycentre lies in between' the two shapes, while for 'curve b' (the yellow curve) the 'raycentre lies in the back'.[163] In the 'Example of Division' *(Fig. 2.23)* a 'peripheral example of division in a square arranged with a help of a central ray system' is shown where 'curve a' (the orange curve) has a 'ray centre at the back' while 'curve b' (the yellow curve) has a 'ray centre in between'.[164] The example in *(Fig. 2.22)* works on the principle of division and partial subtraction while the example in *(Fig. 2.23)* works only on the principle of division. Although both examples share a similar strategy by using centre-oriented radii in generating the mediating line, the achieved results are different due to the methods of division or subtraction.

I would like to suggest that in all these examples, the mediating line is a mobile tool that negotiates between one form and another, operating in transition and in the in-between of two given shapes or forms. If in Klee's scheme a given shape can be seen as a destination, 'mediating lines' can be imagined as in motion between one shape and the other, and the rays or lines of radii can be seen as 'moving tracks' along which the mediating line moves. However, for me, the mediating line is also a point in time, an arrested temporal moment of the imaginary evolving shape that is moving along such tracks. In these experiments, which Klee called 'crossover of forms', the rays of the radii are intersected by mediating line, and I suggest that these rays should be seen as vectors exerting a force and direction onto the mediating line.

My propositions as to how to look at Klee's experiments with the mediating line need further theoretical clarification. First, it is important to note that the mediating line for Klee is a kind of a crossover between forms, to which I have added my view of it as an arrested movement or a particular moment in the process of movement. Second, for Klee, the radii are tracks along which the mediating line is a moment that happens in the path of the rays of the radii, to which I add that the radii should be understood as vectors that guide the mediating line's transformation. In my opinion the relationship between the mediating line and the radii can

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[162] Paul Klee, text from the original notes and papers done on Paul Klee's original drawings for *Instruction Lessons by Paul Klee Mappe 2 [Unterricht Paul Klee], Dessau 1928*, Kathrin Hassold (trans.), (photo.) author, November 2005, (Berlin: Bauhaus ARCHIVE, Inv. Nr. 269127 - 48) p. 8/60.
[163] Klee, *Instruction Lessons by Paul Klee Mappe 2*, p. 8/64.
[164] Klee, *Instruction Lessons by Paul Klee Mappe 2*, p. 8/64.

be understood as intertwined, where the mediating line seems to hold its spatial position only temporarily and always in relation to the radii. Furthermore, in my view, the mediating line is an act of transformation, a moment of becoming, and in Klee's geometrical examples the becoming of a new shape. If the mediating line is a 'crossover', a place between two destinations, for Klee, then in my terms it is a place of becoming of two forms. As such, the mediating line displays a certain kind of volatility where the forces of the radii exert motion in both directions. This mediating line has a temporal, momentary existence, since it is in transition between one shape and another, between one place and another, and as such in my view invites philosophical readings in terms of 'becoming'.

Grosz suggests that in order to understand 'complex processes of becoming that rethink and constitute both life and matter' we have to engender a concept of the 'new' in relation to time, movement and change.[165] For Grosz, it is through time, which is 'a mode of stretching, protraction' that 'conditions of becoming' may be achieved.[166] For me Klee's mediating line, seen as a temporary place and a crossover in between two destinations, is also a location in time that operates through modes of stretching and protraction and negotiates movement between, what Grosz calls, 'the possible' and 'the real'. This movement between the possible and the real is concerned with the process of realization of new evolving forms. For Klee the process of realization can be seen to be implicit in what he calls formation. Grosz, following Bergson, suggests that 'the process of realization, that "movement" or vector from the possible to the real is governed by the two principles of resemblance and limitation'.[167] I would argue that Klee's mediating line resembles the shapes it originates from as well as being limited by them. As such, I argue that the mediating line could be understood as an act of transformation between the possible and the real and as an active force and temporary moment in the process of realization.

For Klee, the point of crossover between one abstract form and another is also a part of a process of formation that he considers analogous with life and with blood circulation in particular. In his diagram of blood circulation *(Fig. 2.24)* he emphasises the processes of degeneration and regeneration that are intrinsic to an organism and to life *per se*. Klee states that 'at the point of crossover, the central organ of movement finds its appropriate place, whence it may control both parts of the circulation'.[168] For Klee, the mediating line is seen as a central organ of movement that may control circulation, but is also constituted by circulation. In an organism circulation regenerates and degenerates, creates new cells and flushes the old

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[165] Elizabeth Grosz, 'Thinking the new: of futures yet unthought', *Becomings: Explorations in Time, Memory and Futures,* (ed.) Elizabeth Grosz, (Ithaca and London: Cornell University Press, 1999), pp. 16-7.
[166] Grosz, 'Thinking the new', p. 25.
[167] Grosz, 'Thinking the new', p. 25.
[168] Paul Klee, 'From structural character to higher proportions; Higher proportions of changeable structural character; Comparative movement; Forming a higher articulation, linear and planar; Circulation as a finite temporal process; Relativity of articulate elements; The circulation of the blood as an example of figuration; Composite events with composite means', *Paul Klee Notebooks, Volume 2, The nature of nature*, Jurg Spiller (ed.), Heinz Norden (trans.), (London: Lund Humphries, 1973), pp. 69-112, 107.

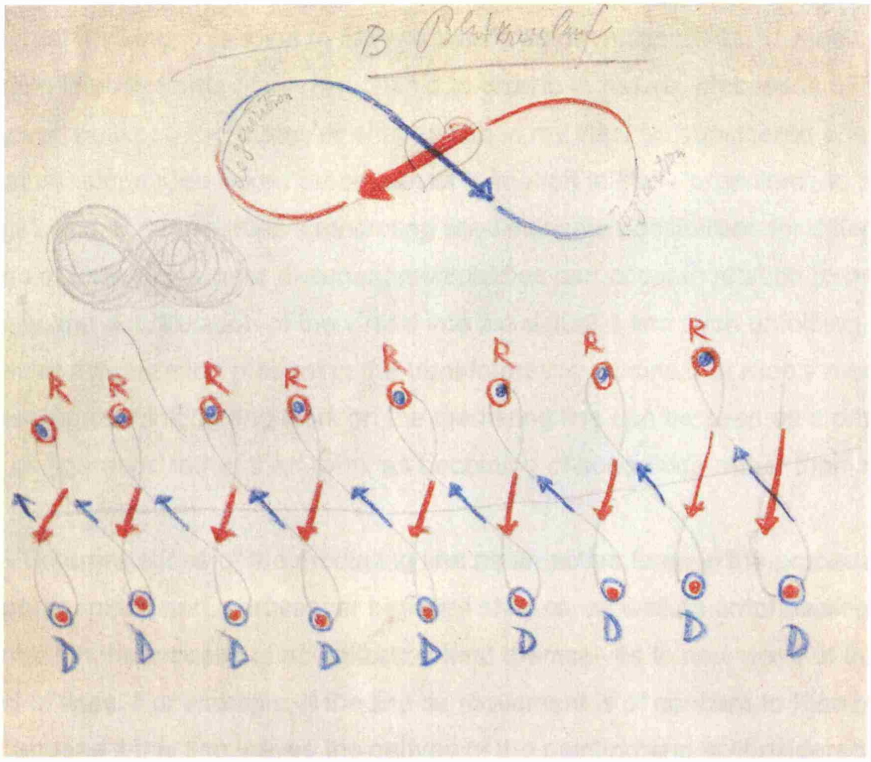


Fig. 2.24. Paul Klee, *Circulation of the blood. IV/23b D=degeneration R=regeneration*, rpt. in *Paul Klee Notebooks, Volume 2, The Nature of Nature*, Jurg Spiller (ed.), Heinz Norden (trans.), (London: Lund Humphries, 1973), p. 108.

ones and offers new conditions through which the life process may evolve. For Grosz, 'life (duration, memory, consciousness) brings to the world: the new, the movement of actualization of the virtual, expansiveness, opening up.'[169] Taking life and time as forces, Grosz suggests that 'the process of actualization involves the creation of heterogeneous terms'.[170] For Grosz, conceptual thinking in relation to life and time creates multiplicities.[171] Klee's investigations into mediating lines in terms of its relationship to growth in nature, processes of formation and 'crossover' between two states or shapes can in my view be considered analogous to life, time and nature; since Klee linked processes of formation to life – 'organism', to time – 'growth' and 'change', and to nature. Klee's mediating lines instigate possibilities for different paths in the process of formation where divergent multiplicities can occur in relation to the unfolding of creativity and actualization of the virtual into the actual. I find such unfolding of creativity and the process of actualization present in the transformative actions that Klee's mediating line offers. In my view Klee's thinking and work on the mediating line can be seen as a process rather than a mark, as figuration rather than form, as becoming of something rather than being something.

Interpretations of the mediating line as an active force in the process of transformation, a temporary place and a crossover between shapes, as well as emphasising the role of movement in the process of actualization lend themselves to new ways of thinking about the making of lines. For example, if the line as movement is of concern to Klee in terms of painting, what happens if this line leaves the canvas of the painting and is considered in terms of other kinds of artistic and also architectural practices?

Jackson Pollock's 'drip paintings' executed by dripping paint onto the ground while moving *(Fig. 2.25)* are an example in my view of an artist experimenting with 'taking a line' beyond the canvas and into the realm of the ground plane. Pollock's drip paintings not only disrupt the ground-figure relationship in painting, but also the viewer's position in space. Art critic Rosalind Krauss suggests that here 'what was lower than both the pictorial image and cultural plane of writing was, it could be seen, the floor, the ground, the beneathness of the truly horizontal'.[172] Krauss also suggests 'that was out of the field of vision and out of the cultural surface of writing and onto a plane that was manifestly below body',[173] allowed for a completely new conception of space in terms of painting/painter, viewer/subject, figure/ground relations. This change in painting brought about by Pollock is something that I consider to have spatialized the nature of painting both in terms of a change in perspective and in the viewer's position. Pollock's way of painting and in particular his technique of dripping questioned the traditional relationship between the artist and the canvas and the display of the work of art in a gallery, yet when exhibited these paintings are traditionally positioned on the wall of the gallery,

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[169] Grosz 'Thinking the new', p. 25.
[170] Grosz 'Thinking the new', p. 27.
[171] Grosz 'Thinking the new', p. 27.
[172] Rosalind E. Krauss, *The Optical Unconscious*, (Cambridge: The MIT Press, 1996), p. 289.
[173] Krauss, *The Optical Unconscious*, p. 289.

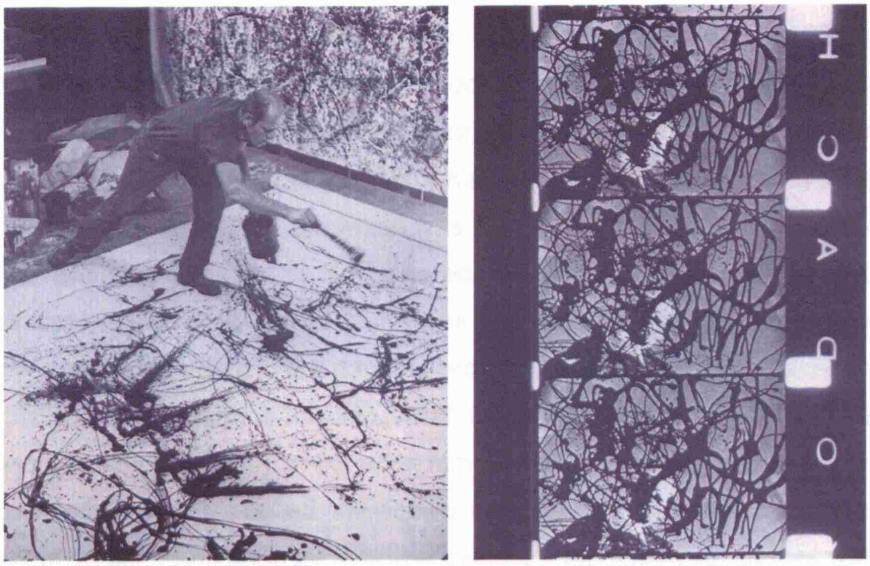

Fig. 2.25. Hans Namuth, film strip from *Jackson Pollock*, (1950), rpt. in Rosalind E. Krauss, *The Optical Unconscious*, (Cambridge, Massachusetts: The MIT Press, 1996), pp. 273, 298.

rather then on the floor. In particular, we can best appreciate this work once we have watched the performative act of creation from the other side of the lens in the film 'Pollock 51' made by Hans Namuth.[174]

In Hans Namuth's film of Pollock painting *Pollock 51* made in 1951 Namuth positioned the camera on the ground, and filmed Pollock dripping paint on glass suspended above the camera. The artist's body is inseparable from the line that mediates the space of painting and the actual space. This line was the line of his gestures and moving body. This line was falling on the ground where he walked on, which was the painting. Constructing the space of the picture plane, as depicted in Namuth's film, allowed the painter to permeate the border between the canvas and the viewer. At the same time as watching the film the viewer feels himself or herself to be an active participant in the painting process as his or her eyes follow the daubs of paint filling the screen. Looking at this film, what is interesting to me is not so much the painting technique, but that the body of the artist himself can be understood as a line of movement, he creates what Krauss has called 'the possibility of making an image by airborne gesture'.[175] This strategy of 'making an image by airborne gesture' has certain similarities with the previously discussed body-line of Klee, where a line has been 'taken for a walk', here across the picture plane.

Pollock saw the ground as a picture plane on to which he threw and dripped paint and over which he moved, but he did not however touch the picture plane. The lines recorded are the lines of movement of the artist's body captured by the camera at the moment of active and progressive line creation. In these creative moments, the line is literally taking a walk. In Pollock's work, as Deleuze has suggested, his 'brush-stroke line and color-daub reach the limit of their function: no longer the transformation of the form but rather a decomposition of matter that yields to us in lineaments and granulations'.[176]

For Deleuze, writing on Pollock's painting, 'man discovers rhythm as matter and material'.[177] Here, according to Deleuze, 'by restoring the world of equal probabilities, by tracing lines that go from one edge of the painting to the other and that begin and continue outside the frame', the relationship between the edge of the painting and the ground is transgressed. In such painting, the process of creation consisting of paint that leaks over the edge of the picture plane, in Deleuze's view 'is 'elevated to intuition, to organic symmetry and center'.[178] For Deleuze, art created by embodied vision, as in the case of Pollock's drip paintings, possesses

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[174] Krauss, *The Optical Unconscious*, p. 301.
[175] Also Krauss particularly 'credits the shift of view to those artists who had the radical vision to undo form, which was recognized to be vertical' which relies on Gestalt psychology where 'form is aligned with body's verticality: it is an object of vision in a plane that is frontoparallel with the plane of vision'. Krauss, *The Optical Unconscious*, p. 302. See also Jeanne Siegel, *Painting after Pollock: Structures of Influence* (Amsterdam: G&B Arts, c 1999), p. 167.
[176] Gilles Deleuze, 'Diagram', *The Deleuze Reader*, Constantin V. Boundas (ed.), (NewYork; Oxford: Columbia University Press, 1993), p. 197.
[177] Boundas, (ed.), *The Deleuze Reader*, pp. 197-98.
[178] Boundas, (ed.), *The Deleuze Reader*, pp. 197-98.

bodily movement as a creative act. In such an act the hand subordinates the eye and the optical horizon becomes tactile ground.[179]

Taking a line from the canvas into space, as Pollock did in his experiment, is a form of performative practice. Although Klee's practice did not take place outside the picture frame, his practice of drawing and painting was concerned with a line that displayed dynamic forces and movement, yet, it stayed within the physical frame of painting or drawing.

In the cases we have discussed a line can be seen as movement. For Klee, the line is 'action' taken for a walk, represented in a painting, while Pollock, in taking the line for a walk, moved it outside the painting. Both lines are active spatial elements, in both cases the line's action and movement describes the space.

The difference I would like to examine next considers they materiality of the line. In painting, materiality is located in pigment, colour, tone, weight, and the rhythm of the line is fixed into the two-dimensional plane of the painting and canvas. What kind of spatial condition particular materialisations of lines engender, is a discussion that is to be continued in the next chapter.

[179] Deleuze suggests that it is possible to see 'abstract painting.... as painting that produces purely optical space and suppresses tactile referents in favour of the eye' while 'action painting... overturns this classical subordination, it subordinates the eye to the hand, it imposes the hand upon the eye, and it replaces horizon with a ground'. Boundas, (ed.), *The Deleuze Reader*, p. 198.

## 3.0: THE MATERIALITY OF THE LINE

Ian Buchanan and Gregg Lambert in their 'Introduction' to *Deleuze and Space* state that according to Deleuze, a 'line traced or created by architecture cannot simply originate in the mind, but must also find its efficient cause in the resistance posed by specific materials and by the variable forms of space that are made possible by the line traced through a multiplicity (material, social, semiotic and so on)'.[1] The idea that social conditions, semiotic meanings and material properties (and so on) form the architectural line bears a close resemblance to Catherine Ingraham's idea that architecture's relationship to linearity is burdensome as it is often 'out of play' with the materiality of the body.

Since my concern is with the way that a line is produced I am also interested in the processes that precede the making of a line and the visual and tactile intuitions that inform such a line. I would like to focus my investigation on one particular aspect of the materiality of the line – one that is concerned with the body as a material structure from which the line may borrow particular properties. Here I would like to focus on the obvious, yet often elusive, objection to the conceptualization of a line – the question of the materiality of the body. Instead of separating the conceptualization of line from the materiality of the body I suggest that materiality is an intrinsic property of a line both in terms of the conception and execution of the line.

Looking closely at the material properties of the line in Paul Klee's creative practice, and his theories on form and formation, it is possible to discover different ways of thinking about the line in visual terms, and through this, produce concepts for how to think of lines architecturally and spatially. In describing or tracing a piece of existing or proposed architecture, the line has a function to describe a space. It possesses rhythm, that is, it has a repetitive way of conveying different forms of materiality, like repetitive elements of a structure. The line also has a particular dimension, that is, it has a different weight or colour when describing the thickness or thinness of a wall. These properties, although architectural, are also visual. Paul Klee's experiments in painting, drawing and teaching practice saw the function, the rhythm and the dimension of the line as necessary properties for the creation and depiction of pictorial space in painting.

Klee understood the function of the line in terms of structures described by networks of lines. For Klee these structures were apparent in nature although not always easy to detect, as they might not reveal themselves without careful observation, Klee saw visual parallels in terms of the function of the line present in these structures. For example, Klee believed that the function of the line was present in the visual linkages that exist in a living body between muscle cells, bone cells or sinew cells. Also, for Klee, the function of the line was visible in recognising

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[1] Ian Buchanan and Gregg Lambert, 'Introduction', in *Deleuze and Space*, (Edinburgh: Edinburgh University Press, 2005), p. 7.

for example an action – the action of a hand creating an artificial structure – here lines were made evident in the process of making. Another function of the line for Klee consisted in how material lines related to each other, how they touched and interpenetrated, and how through lines material relations were visually depicted and invested in a particular visual structure. For Klee, the material relation of different lines belonging to a particular structure (either a structure of a body or any other natural structure) meant that these structures operated on the basis of their mutual material investment, and possessed a particular force and energy. Such forces and energies of the material investments of lines in particular structures reminded Klee of a bodily contact. These, for Klee, were functional aspects of the line and will be explored in **Section 3.1: The Function of the Line**.

For Klee, the line also possessed rhythm, a sequential division based on definite or indefinite numbers. The interrelationship between matter, style and rhythm was for Klee understood in terms of a line's movement. Klee best described this in his numerical chessboard exercises, in which he shows how the line is capable of numerical division. Klee's experimentation with the rhythm of the line consisted in searching of ways to depict movement in painting and how these continuously changing relationships between lines could be rhythmically visualised. The rhythm of the line for Klee is related to the distinction between 'dividuality' and 'individuality', Klee's invented terms for different forms of numerical division. The opposition or synthesis of this relationship for Klee was significant in the process of creating of a particular visual structure that would demonstrate movement. The rhythmic property of the line will be explored in **Section 3.2: The Rhythm of the Line**.

Klee saw dimensional elements of the line as a means to achieve space outside perspective drawing. The dimension of the line, for Klee, meant that a line that is spatial has to possess multiple material properties: measurability, the weight of the tone and the quality of colour. These material qualities for Klee suggested multiple options for the creation of space outside of perspectival drawing. Dimension of the line will be explored in **Section 3.3: Dimension of the Line**.

## 3.1: FUNCTION OF THE LINE

Klee's thinking and practice concerning the materiality of the line including investigations of what materiality meant, originating from ideas of how natural and bodily structures could be visually recognised. In describing 'Material Structures' present in nature Klee saw 'structure' as the 'most varied composition of matter' that could be visually recognized.[2] For Klee, natural structures were analogous to the body. Natural patterns of structural organisation could be recognised visually as bone, muscle and sinew cell structures.[3] Klee saw that structural patterns, which are similar to 'bones', tend to be of a particular shape such as a cell or a tube whereas structural patterns, which resembled sinew, have a stringy texture. Finally, structural patterns analogous to 'muscle' structures consist of 'muscle [-like] fibres'.[4] For Klee, a series of functions operated between these material structures. For example, Klee suggested that these functions resembled the function of the body in motion, where the so-called 'sinew' or 'ligaments' mediated between the bone and the muscle. Sinew and ligaments in the body operated at the level of 'an ancillary' function, or what Klee describes as 'a structure of functions'.[5] For Klee this relationship between material and structure operates functionally during motion.

To draw an analogy between material and structure in relation to the active body suggests also a particular understanding of the body in which the body is not a static system but an operative one. Such an understanding the body bears a similarity to Elizabeth Grosz's philosophical definition of the body as 'neither a locus of consciousness nor an organically determined entity', but, rather, an active body that is best understood in terms 'what it can do, the things it can perform, the linkages it establishes, the transformations and becomings it undergoes'.[6] Suggesting that the body should be seen as 'discontinuous, nontotalizable series of processes, organs, flows, energies, corporal substances and incorporeal events, speeds and durations' Grosz locates the body to be 'outside of binary oppositions' like ' mind/body, nature/culture, subject/object and interior/exterior oppositions'.[7] Grosz's philosophical definitions of the body offer an insight into understanding the analogy Klee makes between structures and the body as an organism and operative system.

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[2] Paul Klee, text from original drawings and notes from *Instruction Lessons by Paul Klee 9 [Unterricht Paul Klee] on Formations and Theory of Form [Gestaltungs und Formlelere],* (1930), Kathrin Hassold (trans.), (photo.) author, November 2005, (Berlin: Bauhaus ARCHIVE, Inv. Nr. 10365/33 – 58), p. 54.
[3] Paul Klee, 'Material Structures' *[Materielle Strukturen], Pedagogical Sketchbook [Pedagogisches Skizzenbuch],* Kathrin Hassold (trans.), (Berlin: Gebr. Mann Verlag, 1997), p. 16.
[4] Klee, 'Material Structures', p. 16.
[5] Paul Klee, 'The Natural Motion Organism as a Will of Motion and Execution of Movement (Para – materially)' [Der naturliche Bewegungsorganismus als Bewegungswille und Bewegungsvollzug. (Ubermateriell)], *Pedagogical Sketchbook [Pedagogisches Skizzenbuch],* Kathrin Hassold (trans.), (Berlin: Gebr. Mann Verlag, 1997), p. 17.
[6] Elizabeth Grosz discusses Deleuze and Guattari's notion of the body in 'Intensities and Flows', *Volatile Bodies: Toward Corporeal Feminism,* (Bloomington and Indianapolis: Indiana University Press, 1994), pp. 160-183, 165.
[7] Grosz, *Volatile Bodies,* p. 164.

For Klee, 'artificial structures' are also analogues to natural, body-like structure, in the way they operate. In the example of what he calls 'chained' structures (patterns of structures that could be recognized in terms of chained elements) Klee saw the structures to be interconnected in a way similar to interconnection of the sinew structures in the body. In another example, this time of 'scaled' structures, Klee saw such structures as similar to the examples of muscle fibres. And in using the example of 'textile structures', Klee suggested that such structures consist of a particular textures similar to 'bone' patterns of organisation. While drawing parallels between material structures in nature and artificial structures, Klee also used particular verbs to describe the functionality and operative energy of artificial structures. For Klee 'to build', 'to join' and 'to plait' are words that describe the making of artificial structures where there is 'the rhythm of the hand-movement'.[8] Such verbs describe not only the making of artificial structures, but also recognition of a particular action. Such an action leaves a visual trace of the hand that created such structure. Action, be it of 'building', 'joining' or 'plaiting', not only describes the process of the hand's movement, but also describes the materiality of the line that has been achieved through the particular function of such a process, the process of making and the process of investing one material into another.

Grosz, discussing the relationship between architecture and making, suggests that 'what is now in question is the making of things, and from which things are made, rather than the things made'.[9] The process of making of things, for Grosz, is a 'rigorous process intuition draws us toward, not things themselves so much as the teeming, suffuse of network within which things are formed and outlined, the flux of the real'.[10] For Grosz, 'this teeming flux of the real, [...] the integration and unification of the most minute relations of matter so they exist only by touching and interpenetrating; the flow and mutual investment of material relations into each other'.[11] This integration and unification of the most remote relationships of matter is for Grosz an important distinction in architecture. To 'build' a wall of brick and mortar suggests a movement of the hand and the laying of bricks in a particular order joined by mortar, integrating and unifying the relation between brick and mortar. The regular visible functional lines created by the builder's hand invest material relations into brick and mortar, resulting in a brick wall. When drawn or painted the regular structure of a brick wall can be seen both as a material surface and a set of functional lines. Seen as a unified surface, such a wall demonstrates a material structure. Seen as set of abstract lines, the wall demonstrates a functional materiality. Klee's relationship between material and structure seems to lie in the latter where he is thinking about the function of the line in respect to such material structures. By de-coding the way things get made, Klee discovered what underlay particular structures. Drawing on his close observations of natural structures, Klee created new visual theories. His observations and the

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[8] Paul Klee, text from original drawings and notes from *Instruction Lessons by Paul Klee 9 [Unterricht Paul Klee]* on *Formations and Theory of Form [Gestaltungs und Formlelere],* (1930), Kathrin Hassold (trans.), (photo.) author, November 2005, (Berlin: Bauhaus ARCHIVE, Inv. Nr. 10365/33 - 58), p. 54.
[9] Elizabeth Grosz, 'The Thing', Elizabeth Grosz, *Architecture from the Outside: Essays on Virtual and Real Space*, (Cambridge, Massachusetts; London, England: The MIT Press, 2001), pp. 167-183, 179.
[10] Grosz, 'The Thing', p. 179.
[11] Grosz, 'The Thing', p. 179.

conclusions he drew from them look at how natural, bodily and artificial structures may generate methods for different creative practices. *(Fig. 3.1)*

To 'join' is an action, an event, which joins two sets of materials, planes or lines. This process for Klee is a structural, material, functional and visual problem. A joint always appears tc generate a tension or compression of at least two different materials or structures that operate simultaneously. Translated into a drawing of lines, the act of joining, for Klee, suggests a way of drawing such function. Such lines, for Klee could be, for example, zigzagged, interrupted or under tension and compression, but in any case, the execution of the lines should demonstrate what particular function they are to fulfil. *(Fig. 3.1)*

'To plait' is Klee's term for a way of interconnecting lines without the lines being separated or joined using a third element. When two or more lines are plaited visually, such lines may possess similar or dissimilar materiality, but their existence is represented in such a way as to preserve each line's individuality while performing the unified entity of a seamless joint. In plaiting, this individuality is both preserved and represented by the line's unique functionality, plaiting and interweaving an interconnected pathway with and through another line's materiality. *(Fig. 3.1)*

Building, joining or plaiting are actions of making which, if we refer to Grosz's argument concerning making, can be understood as actions that can only happen through touch and through integrating and investing material relations through, and into each other. Each movement of the hand, in building, joining or plaiting, allows for an integration of matter - the hand builds a row of bricks, plaits a fabric or joins two materials together. The movement of the hand in such making processes as these creates a line of making which is to be seen as a material line, one that exists through its own functionality. For Klee line's function defines the materiality of the line.

In analysing material structures, Klee describes one aspect of a line's functionality as a force. For Klee 'the line emerges out of the point and at collision with other lines' where 'new point centres emerge'.[12] Klee named such lines as: 'strike', 'curve', 'breakthrough', 'impact and tension'.[13] In distinguishing lines in terms of their force, the line acquires bodily characteristics. For example, for Klee, 'a line that is breaking-through' possesses 'a weaker expression' compared to 'a line that is doing a strike and enduring it' while 'the breakthrough line evades, escapes to the sides'.[14] For example, the 'breakthrough' line could possess an impulse that

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[12] Josef Albers, *File: Material Summary Writing about the Theme [Dosier: Material gesammenstellung zum Thema Schrift] Map 4 [Mappe 4]* (earlier from Annie Albers Map 4 [vorher: Anni Albers Mappe 4]) copies of different lectures borrowed from Bauhaus, after 1930. Notes next to Kandinsky and Klee lectures during semester (1930/31) [Auf zeichnungere zu Kandinsky und Klee: Unterricht, semestre 1930/31] Kathrin Hassold (trans.), (photo.) author, November 2005, (Berlin: Bauhaus ARCHIVE, Inv. Nr. 1995/17.34 – 17.86 and 1995/17.87 – 17.137), p. 97.
[13] Albers, *Material Summary*, p. 97.
[14] Albers, *Material Summary*, p. 97.

causes it to wither away while its energy spills over into another space of the picture. On the other hand, the line that strikes possesses a consistent force and thickness when drawn, while remaining spatially contained within the space that it strikes.

In reference to Deleuze, Klee's definitions of the function of the line in terms like 'strike', 'breakthrough', 'curve', or to have an 'impact and tension', describe different types of qualitative force that a line may possess. For Deleuze, according to Cliff Stagoll, 'a force is "active" if it seeks dominance by self-affirmation, asserting itself over and above another, and "reactive" if it starts its struggle by first denying or negating the other force'.[15] Stagoll suggests that Deleuze is interested in 'origin of forces' rather than the focus on 'the complex that derives from them'.[16] Similarly Klee's own interest in material structures and functions of the line are linked to force and activity. For Deleuze, things are 'merely a temporary outcome' that can result in 'an apparently substantial reality' that emerges from forces that 'act upon other forces'.[17] Klee's functional lines seem to display such temporality as they 'breakthrough', 'curve' or 'impact' a particular territory in a painting.

A different function of the line occurs through 'progression'. Here Klee describes graphically a numerical progression of the line that consequently results visually in a colour relation between white, grey and black. In three examples 'from white to grey', 'from black to grey' and 'polar scale' Klee describes a numerical method whereby numbers through addition progress: 'through continuous addition, one can get progressive value'. [18] *(Fig. 3.2)* If a line is assigned a certain sectional length, and such a length is assigned a particular colour tone, then the progression depends on the scale of the coloured area.

Klee further developed these ideas in his 'chess-board' exercises and diagrams. Klee starts with what he calls a 'structural formation' in which he suggests that 'measuring and weighing' is 'a pictorial procedure' in which he makes 'measurements of time and length'. [19] Using simple forms of linear addition from left to right and from top to bottom, Klee produces a 'structural design' that he describes as 'an addition of units in two dimensions'. [20] By repeating views of lines being divided in this way Klee created a grid or rather 'chess-board' diagrams.

Progression for Klee is seen in terms of time and distance. In the examples with lines 'interpenetration of progression and regression' is 'not a result in itself but an expression of

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[15] Cliff Stagoll, 'Force', *The Deleuze Dictionary*, Adrian Parr, (ed.), (Edinburgh: Edinburgh University Press, 2005), pp. 106-8, 107.
[16] Stagoll, 'Force', p. 107.
[17] Stagoll, 'Force', p. 107.
[18] Klee, Instruction Lessons by Paul Klee 9, p. 46.
[19] Paul Klee, 'Structural formation. Individual and dividual characters; Measuring and weighing as a pictorial procedure; Measurements of time and length', *Paul Klee Notebooks, Volume 1, The Thinking Eye*, Jurg Spiller (ed.), Ralph Manheim (trans.), (London: Lund Humphries; New York: George Wittenborn, 1961), pp. 217-22, 217.
[20] Klee, 'Structural formation', p. 217.

function'.[21] The interpenetration of progression and regression is a dynamic and temporal process. The temporality of this process, for Klee, is expressing the function of time and duration. In order to understand this link between temporality and function I would like to turn for the moment to Grosz's philosophical account of duration. Grosz sees duration as 'multiplicity of succession, heterogeneity, differences in kind and qualitative differentiations'.[22] In his diagrams *(Fig. 3.2)* Klee aimed to demonstrate progression through sequentially divided distances that demonstrated the line's functionality in terms of movement; a progression or regression along a temporal path. In other words, a line could be divided in such a way as to demonstrate progression over time. Equally, different tones could be used for the same purpose. If we take Grosz's term the 'multiplicity of succession', then Klee's exercises in demonstrating progression can be considered as durational. However, Grosz's definition of duration also involves ideas of heterogeneity and difference, the kind that can also be seen in Klee's exercises on different tones and lengths of lines demonstrating progressions over time.

Klee further expanded his understanding of the functionality of the line by introducing the qualities of measure and weight. Combining measure and weight created more complex structures in which a line can be divided in two ways. Firstly, dividing a line in terms of measure meant that the value of each segment was represented with a number *(Fig 3.3)*. However Klee differentiated between the numerical and visual function of the line. Klee states that while two structures 'are exactly alike if we compare their numerical expression', their difference lies 'in the choice of pictorial elements'.[23] For Klee, the distinction lies in the quantitative and qualitative aspects of the line. In his notebooks *(Fig. 3.3)* he shows two structures in which 'the first structure makes use only of a "single unit distance" and "a double unit distance", which are to be seen as (quantities) and measurements' while ' the second makes use of the weights which are to be seen as light and dark (qualities)'.[24] (Further Klee puts 'measure on one side, weight on the other'.[25] In making the distinction between the quantitative and qualitative aspects of the line, Klee further elaborates on the role of force in the function of the line. Klee suggests that in the case of measuring distance 'a force does the increased work [...] without extra strain, simply by taking extra long'. However, in the case of weight there is 'a force which works towards its higher goal by doubling its energy'.[26]

For Klee, understanding the measure and weight in relation to the function of the line is a question of materiality that concerns the balance between the quantitative and qualitative properties of the line, as well as the balance between measure and weight. In order to make this point Klee describes two ordinary events – the everyday life of hanging a picture and the cutting of a long wooden pole:

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[21] Klee, 'Structural formation', p. 218.
[22] Grosz, *Architecture from the Outside*, p.114.
[23] Klee , 'Structural formation', p. 220.
[24] Klee , 'Structural formation', p. 220.
[25] Klee , 'Structural formation', p. 220.
[26] Klee , 'Structural formation', p. 220.

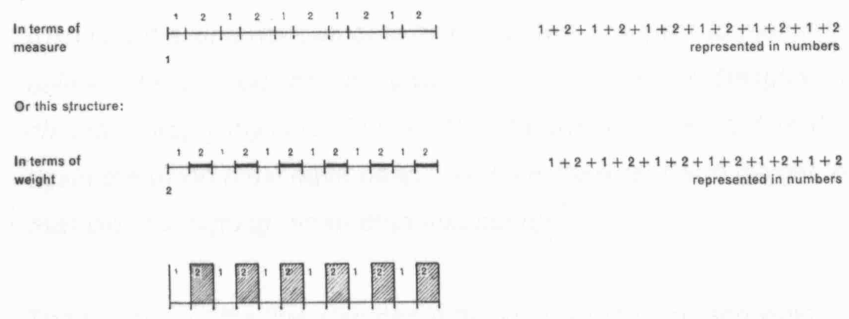


Fig. 3.3. Paul Klee, *In the use of measure and weight*, rpt. in *Paul Klee Notebooks, Volume 1, The Thinking Eye*, Jurg Spiller (ed.), Ralph Manheim (trans.), (London: Lund Humphries; New York: George Wittenborn, 1961), p. 220.

*Wishing to attach a hook to a picture frame, I measure the top most carefully to find the centre. I fix my hook exactly in the centre and feel sure that everything will be all right. But in the end my picture slants. Why does it slant? Because the wood is not of the same density throughout, or perhaps the glass is thicker and heavier on one side. In short, I have made the mistake of measuring rather than weighing. In another case I wish to cut a long wooden pole exactly in two. It seems to me that the simplest way is to balance the pole on something with a knife-sharp edge. Delighted at my cleverness I cheerfully apply my saw. The result: two parts of entirely different length. How so? Here again the wood must have been uneven in thickness and weight, and I have made the mistake of weighing rather than measuring.*[27]

The function of the line also depends on how measure and weight are distributed along the line. In Klee's terms in the 'movement of measure' such movement is seen as 'broadening-narrowing, expansion, contraction' of the line, and in the 'movement of weight' movement is seen as 'thinning-thickening, or stretching-tightening'.[28] Here Klee proposes a 'theorem' that describes what the concepts of weight and measurement mean in relation to the function of the line: 'Weight is the degree of density of an element compared with another element. In such a definition the rule is: extension and contraction of tone value connected with measure, the enlargement and diminution of surface content'.[29] This theorem suggests that, for Klee, colour and tone had a particular weight.

Further experimenting with colour, Klee allocated different numbers to different colours. Ranging from one to nine, Klee started with white, which had a value that was determined by the number one and finished with black whose value was determined by the number nine. In between one and nine there where other colours: two for yellow, three for orange, four for red, five for grey, six for blue, seven for green, eight for violet (for Klee grey was always in the middle, used as a balancing tone and here it is positioned in the middle of numerical spectrum as well as visual spectrum). This Klee called 'numerical ordering'.[30] In various examples of thirty-six coloured square chess - board diagrams, Klee played with an equal number of coloured squares and their numerical and visual ordering. *(Fig. 3.4)* What is evident in these exercises is Klee's desire to achieve a balance between weight and measure of colour while disturbing pure symmetrical or numerical ordering *(Fig. 3.4, 3.5)*. Klee kept re-ordering colour combinations by repeating what he called 'composite' [31] units *(Fig. 3.6)* which consisted either

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[27] Klee, 'Structural formation', p. 221.
[28] Klee , 'Structural formation', p.220.
[29] Klee , 'Structural formation', p.220.
[30] Paul Klee, text from original drawings and notes from *Instruction Lessons by Paul Klee 7 [Unterricht Paul Klee]* on *Formations and Theory of Form [Gestaltungs und Formlelere],* (1930), Kathrin Hassold (trans.), (photo.) author, November 2005 , (Berlin: Bauhaus ARCHIVE, Inv Nr 10365/1 – 20), p. 56.
[31] Klee suggested that the combination of two dimensions produces a composite unit to which number could be allocated. See Paul Klee, 'Weight structure in two dimensions', *Paul Klee Notebooks, Volume 1, The Thinking Eye*, Jurg Spiller (ed.), Ralph Manheim (trans.), (London: Lund Humphries; New York: George Wittenborn, 1961), p. 226.

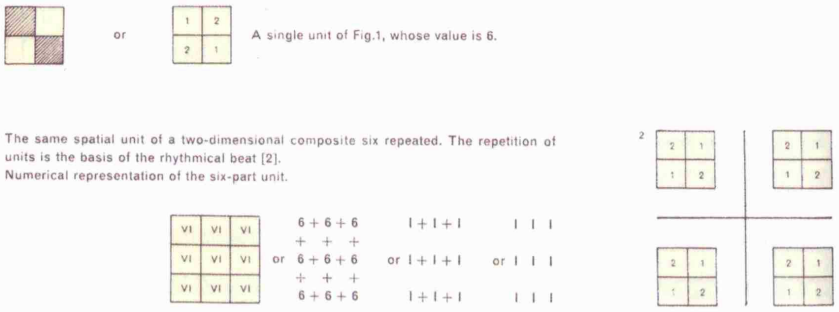


Fig. 3.6. Paul Klee, *The composite units*, rpt. in *Paul Klee Notebooks, Volume 1, The Thinking Eye*, Jurg Spiller (ed.), Ralph Manheim (trans.), (London: Lund Humphries; New York: Gorge Wittenborn, 1961), p. 226.

of four or nine coloured squares and shifting such composite units by various strategies *(Fig. 3.5)* (mirroring, rotating and inverting) these allowed him to change the structure and configuration of the picture.

Although this numerical ordering may look like a mathematical method, Klee always underlined the creative or surprise element. In his painting 'Chess' (1931) *(Fig. 3.7)* Klee used the line's functionality to demonstrate strategies of progression and regression where 'the natural progression of the lengths and thicknesses (measure and weight) of lines and of their intervals' occurred in order to disturb the chessboard field.[32] *(Fig. 3.8)* For Klee, such 'interpenetration of progression and regression' was 'an expression of function' of time as well as space.[33] The vertical black lines in *Chess* show a 'varying progress of movement' in which 'the intervals indicate the measure of time'.[34] In addition, Klee states that 'each progression results in a spatial factor'.[35] Aiming to see the function of the line in terms of time and space led Klee to experiment extensively with chessboard exercises and paintings. Compared to another similar painting from the series, 'Superchess' (1937) *(Fig. 3.9)*, 'in 'Chess' there is a visual division given, while in 'Superchess' it should be thought of as the basis of measurement or function'.[36]

What Klee also concluded from his examples of chessboard diagrams was that the 'square breaks down horizontally and vertically into pairs of neighbouring fields'.[37] The importance of this discovery lead Klee to suggest numerous variations for how the 'neighbouring fields' could be functionally organised and related. For example, he suggested 'further variations at will, by repeating composite units designed for the following kinds of repetition: reversal, displacement, reflection and rotation'.[38] *(Fig. 3.6)*

In the arrangement of neighbouring fields, the function of the line changes, depending on the line's role in contacting the neighbouring fields. The first point of contact between two fields in Klee's terms is 'tangency'. Tangency can occur, according to Klee, 'in point', 'in line', 'area' and 'space'.[39] Klee clearly distinguished between the 'tangency of equal things and the 'tangency of different things'.[40] For Klee when two adjoining fields 'contact as lines' such contact may be either 'balanced' or 'unbalanced', depending on the similarity or difference of two adjoining fields,[41] in other words, 'if the pieces are divided into the same size we can talk about

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[32] Klee , 'Structural formation', p. 218.
[33] Klee , 'Structural formation', p. 218.
[34] Klee , 'Structural formation', p. 219.
[35] Klee , 'Structural formation', p. 219.
[36] Klee, 'Structural formation', p. 219.
[37] Klee, 'Weight structure', p. 226.
[38] Klee, 'Weight structure', p. 228.
[39] Hannes Beckmann, text from original drawings and notes, *Instruction lessons by Paul Klee [Unterricht Paul Klee] Map 2 [Mappe 2], BH Dessau* (1930), copies [kopien], 26 p. [bl.], Kathrin Hassold (trans.), (photo.) author, November 2005, (Berlin: BAUHAUS Archive) p. 8.
[40] Klee, *Instruction Lessons by Paul Klee 9*, p. 48.
[41] Klee, *Instruction Lessons by Paul Klee 9*, p. 48.

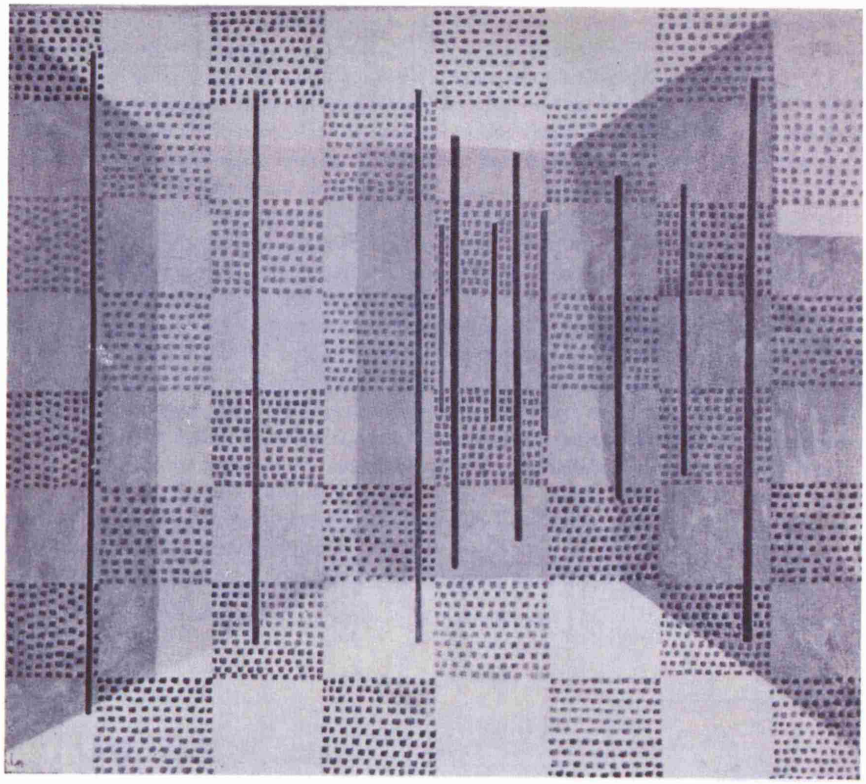

Fig. 3.7. Paul Klee, *Chess,* Oil, (1931), Galerie Baeyeler, Basle, rpt. in *Paul Klee Notebooks, Volume 1, The Thinking Eye*, Jurg Spiller (ed.), Ralph Manheim (trans.), (London: Lund Humphries; New York: Gorge Wittenborn, 1961), p. 216.

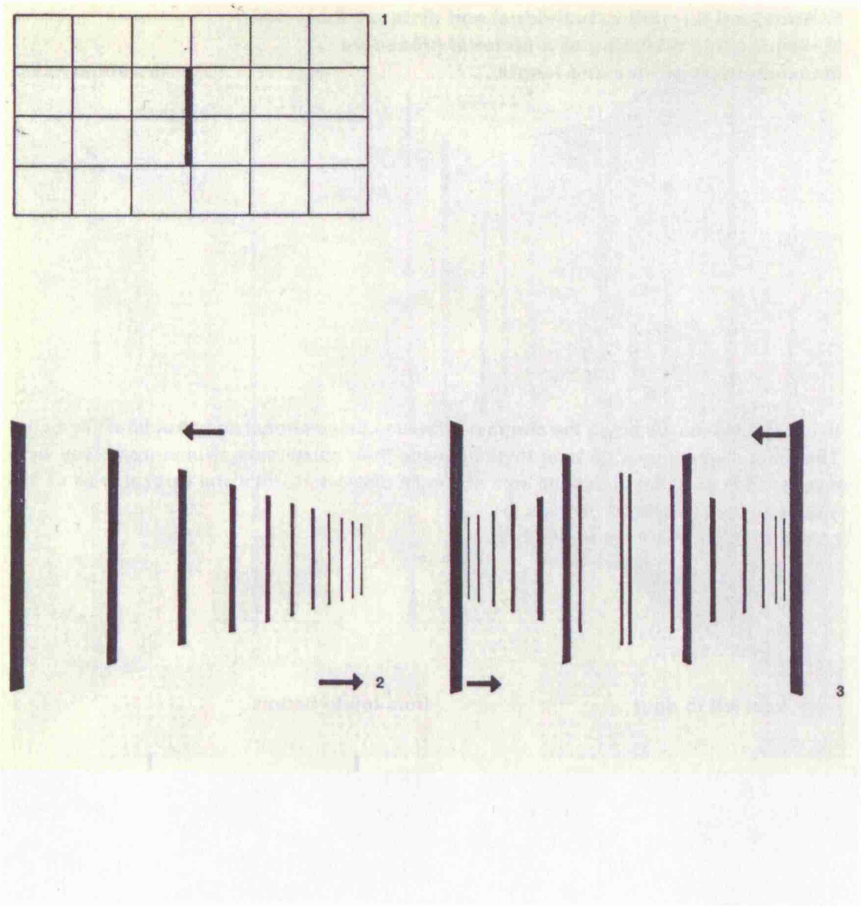


Fig. 3.8. Paul Klee, *The natural progression of the lengths and thicknesses of lines and of their intervals*, rpt. in *Paul Klee Notebooks, Volume 1, The Thinking Eye*, Jurg Spiller (ed.), Ralph Manheim (trans.), (London: Lund Humphries; New York: Gorge Wittenborn, 1961), p. 218.

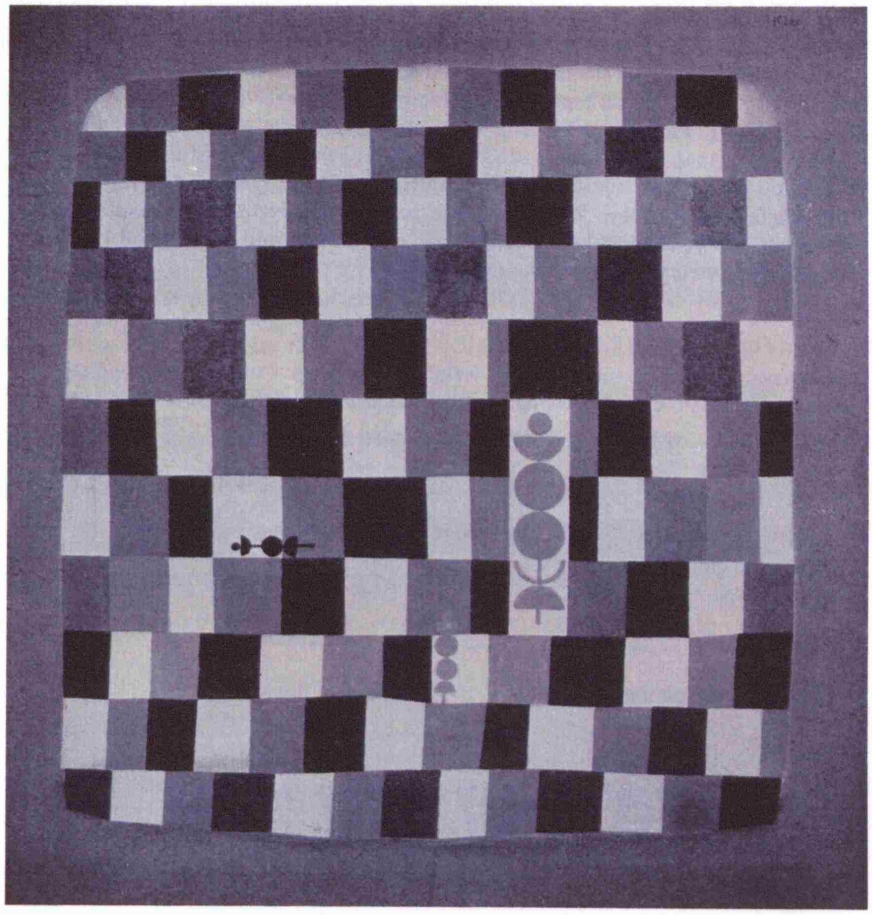

Fig. 3.9. Paul Klee, *Superchess*, Oil, (1937), Kunsthaus Zurich, rpt. in *Paul Klee Notebooks, Volume 1, The Thinking Eye*, Jurg Spiller (ed.), Ralph Manheim (trans.), (London: Lund Humphries; New York: Gorge Wittenborn, 1961), p. 222.

balance' while if the sizes are different then one side must 'give up independence',[42] which results in an unbalanced contact.

For Klee, there were four ways that contact could be made between similar or different pictorial elements – neighbouring fields. Contact could happen as a 'contact of points', a 'contact of lines', a 'tangency in the area' and a 'tangency in a space'.[43] In the example of the chessboard structures, the contact between differing adjoining fields happens both as 'point tangency' and 'area tangency'.[44] Depending on the function of such contact the whole structure of the picture can be changed in character. *(Fig. 3.10)*

Klee's understanding and practice of materiality in painting is closely related to the function of the line. For Klee function not only operates between material and structure but also possesses a particular action and force. Operating through principles of progression and regression, the function of the line becomes related to time and distance, measure and weight. Finally, for Klee, the function of the line also has a particular role in contacting adjoining fields of structures, colours, areas and materials. However, there is another aspect of the line that expands the line's functionality. Klee carefully considered the complex rhythms of the line. This is discussed in detail in the following section in relation to time and duration.

[42] Beckmann, *Instruction Lessons by Paul Klee Map 2*, p. 8.
[43] Klee, *Instruction Lessons by Paul Klee 9*, p. 49.
[44] Klee, *Instruction Lessons by Paul Klee 9*, p. 39.

## 3.2: THE RHYTHM OF THE LINE

*Rhythm is the strict repetition of a unit, a unit that can be sectional.*[45]

*We can perceive rhythm with three senses at once. First we can hear it, secondly see it, and thirdly feel it in our muscles. This is what gives it such power over our organism.*[46]

In his teaching notes on structures Klee analysed carefully how a particular structure consists of a number of repetitive elements. Such elements Klee saw as temporal sections and compared them to musical rhythms: 'one tact', 'two tacts', 'three tacts', 'four tacts and 'five tacts'.[47] In order for a line to be rhythmical, Klee suggested that it had to possess at least two or three such 'tacts'. Klee also distinguished rhythm in each individual tact, stating that 'in the homogenous tact itself there occurs a multicoloured, equally structured tact' [48] *(Fig. 3.11)*. Drawing on his musical background Klee graphically represented one, three, five and twelve tacts in the structure of the line. Creating a subdivision in terms of tact originated from the musical syncopation of rhythms in each tact. *(Fig. 3.12)*

Klee observed a different kind of rhythm in the structure of the body. For Klee the heart beats in one tact[49] rhythm, while breath has a two tact rhythm. Walking, for Klee, consisted of a more complex rhythm where both 'arms and legs' moved in a slightly different rhythm of the tact.[50] In walking Klee saw an interchange between what he called rhythms of 'regeneration' and 'degeneration' that happen cyclically and 'in repetitions when walking'.[51]

Also, in the wider context of nature, Klee saw rhythmical changes that he called 'cosmic rhythms'. These were daily rhythms present in the change between 'day and night', or seasonal rhythms present in the change between 'summer and winter', as well as yearly rhythms present in the cycles of the 'twelve full months'.[52]

Klee applied his observations of various rhythmical structures to his experiments on visual two-dimensional surfaces. In his chessboard exercises Klee analysed the rhythmical expression of the whole visual structure in relation to the distribution and repetition of a coloured area. In the example of the 'rhythm of an area/surface' Klee suggested that a 'new order emerges' when a rhythmical expression of the coloured area and its structural organisation is

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[45] Klee, *Instruction Lessons by Paul Klee 9*, p. 50.
[46] Paul Klee , 'Rhythms and rhythmic structures' *Paul Klee Notebooks, Volume 1, The Thinking Eye*, Jurg Spiller (ed.), Ralph Manheim (trans.), (London: Lund Humphries; New York: George Wittenborn, 1961), p. 267.
[47] Klee, *Instruction Lessons by Paul Klee 9*, p. 50.
[48] Klee, *Instruction Lessons by Paul Klee 9*, p. 50.
[49] 'Tact' is a German word and linked to music (Klee was an active violin player and his wife Lili was a piano player). In English 'tact' is best translated with similar musical terms – a 'beat' or 'meter'.
[50] Klee, *Instruction Lessons by Paul Klee 9*, p. 51.
[51] Klee, *Instruction Lessons by Paul Klee 9*, p. 52.
[52] Klee, *Instruction Lessons by Paul Klee 9*, p. 52.

changed.[53] *(Fig. 3.13)* This analysis provided variations on a theme that depended on the rhythmical distribution of colour fields in a particular structure of the chessboard example.

For Klee ' rhythm and structure often go together' and between the two 'numbers play a big part'.[54] According to the particular organisation of numbers Klee saw two other categories in relation to rhythm and structure: the category of 'manageable amount' and the category of 'the unmanageable' amount.[55] The category of 'manageable amount' meant for Klee that the 'number is un-divisible', while the category of 'the unmanageable amount' meant that the 'number is divisible'.[56] A category that cannot be divided numerically Klee termed 'individual', and a category, which could be divided numerically 'dividual'.[57] The 'individual' category, for Klee, was visually of a 'macroscopic' character, while the 'dividual' category was visually of a 'microscopic' character.[58] *(Fig. 3.14)*

Klee made numerous experiments investigating the rhythm of the line. Such experiments were analytically depicted in the examples of what he called 'individual' and 'dividual' rhythmical structures. For Klee, 'individual rhythms' were present in 'individual structures' and they 'cannot [...] be reduced to single or similar numbers, but inexorably only to ratios'.[59] One such example is the *Golden Section,* where 'the smaller part is to the larger part as the larger part to the whole: a: b=b: (a+b)'.[60] In this example, when looked as a 'rhythmic individual whole', Klee saw a rhythmical repetition of what he called a 'composite unit' that was expressed as '1 = 8: 13' ratio.[61] *(Fig. 3.15)*

In structures that consisted of 'individual' or 'dividual' categories, Klee further observed that 'formations which inter- digitate' and which 'help each other' are 'organised'.[62] In an example of what Klee called a 'homophone' structure, 'the pieces subordinate to the ensemble without contradiction' and without 'tensions'.[63] However, for Klee, 'the more complicated the pieces are in regards to their wiring' within a particular structure ' the higher is their level of development'. [64] As with many things Klee saw these structures as present in nature, where 'the whole structure appears again in small things, like the leaf, branches and trunk of a tree'.[65] *(Fig. 3.16)*

For Klee, a 'polyphonic' structure as opposed to a 'homophonic' structure consisted of 'characters of higher development', where one character may go against the organisation of the

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[53] Klee, *Instruction Lessons by Paul Klee 9*, p. 53.
[54] Klee, *Instruction Lessons by Paul Klee 9*, p. 55.
[55] Klee, *Instruction Lessons by Paul Klee 9*, p. 55.
[56] Klee, *Instruction Lessons by Paul Klee 9*, p. 55.
[57] Klee, *Instruction Lessons by Paul Klee 9*, p. 55.
[58] Klee, *Instruction Lessons by Paul Klee 9*, p. 55.
[59] Klee , 'Individual rhythms', *Paul Klee Notebooks, Volume 1, The Thinking Eye*, Jurg Spiller (ed.), Ralph Manheim (trans.), (London: Lund Humphries; New York: George Wittenborn, 1961), p. 231.
[60] Klee , 'Individual rhythms', p. 231.
[61] Klee , 'Individual rhythms', p. 231.
[62] Klee, *Instruction Lessons by Paul Klee 9*, p. 56.
[63] Klee, *Instruction Lessons by Paul Klee 9*, p. 56.
[64] Klee, *Instruction Lessons by Paul Klee 9*, p. 56.
[65] Klee, *Instruction Lessons by Paul Klee 9*, p. 56.

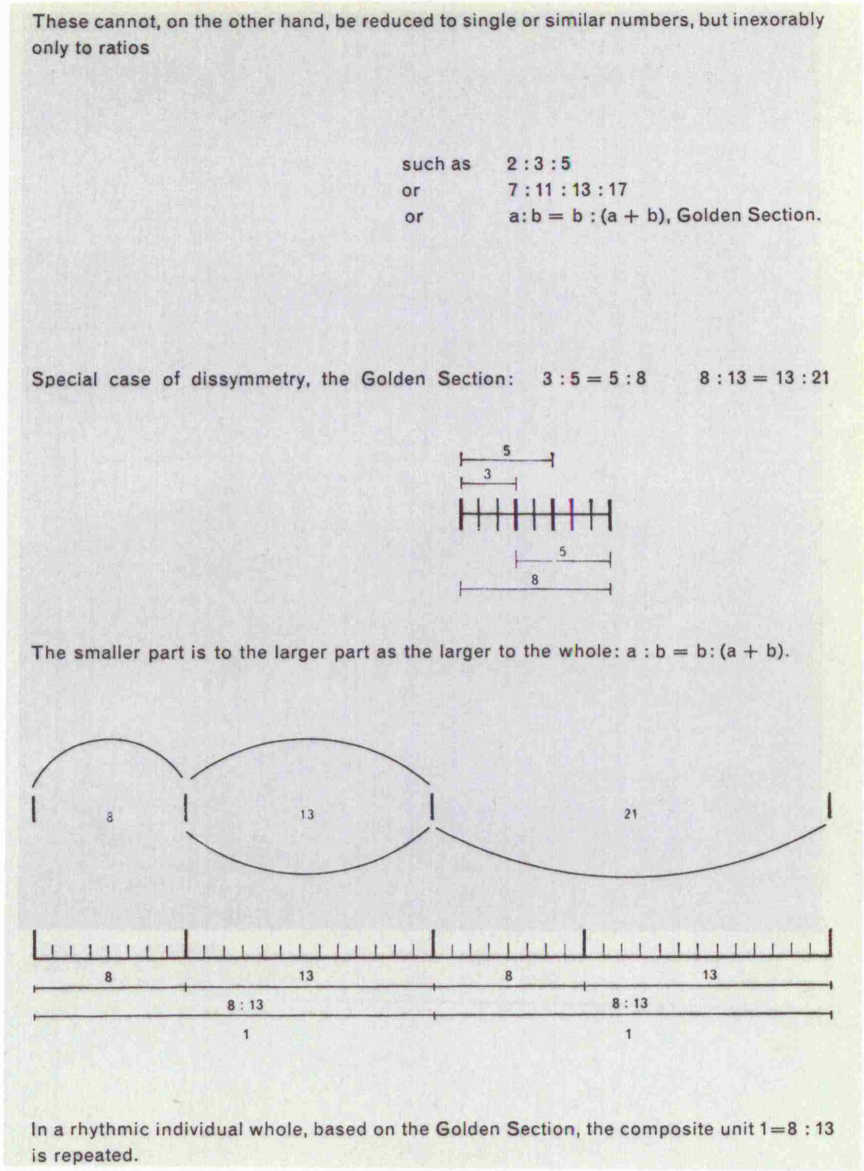


Fig. 3.15. Paul Klee, *Composite unit in the Golden Section*, rpt. in *Paul Klee Notebooks, Volume 1, The Thinking Eye*, Jurg Spiller (ed.), Ralph Manheim (trans.), (London: Lund Humphries; New York: George Wittenborn, 1961), p. 231.

whole structure and create 'dissonances' but the result would still remain 'harmonic'.[66] Such 'harmonic polyphony' is for Klee attached to the idea of music where many voices co-exist together at the same point in space, and yet, where certain 'augmentation' can occur.[67] Through visual depiction, Klee attempted to represent the lines of 'voices', which can have different rhythms within a particular structure. Such voices could be seen as 'horizontal', 'vertical', 'diagonal' and 'circular' lines that determine different pictorial areas and that such areas may result in looking reduced or augmented.[68] *(Fig. 3.17)* In another example of 'polyphony', the structural elements of augmented or reduced coloured areas in a painting seem to be in a direct relationship to what Klee calls 'constitutional' pictorial elements: the 'point' and the 'line'.[69] *(Fig. 3.18)* In other words such coloured areas in a polyphonic structure might intersect or make contact through the point or line and, depending on how such a contact or intersection was made, the whole constitution of the picture could be altered.

Klee recognized that there were three major properties in relation to the rhythm of the line. First, there was a 'structure' - this for Klee, was 'the question of articulation, natural or otherwise, of matter',[70] while matter was an 'arrangement of the atoms in the molecule of a compound, expressed by the structural formula'.[71] Second, there was 'style' – this could be recognized in 'the question of the traces of the diverse manual movements'. [72] Finally, there was 'rhythm' – this could be recognized in terms of numerically repetitive measures. This was evident once 'a number such as 2 or 3 (or possibly 1), 4 (as 2+2) or 6 (as 2+2+2) is repeated as the subdivision of a unit'.[73]

For me structure – in terms of organisation of matter, style – in terms of visible manual movements and rhythm – in terms of sequential numerical measures were interconnected in the visible materiality of the line. However, all three properties of such lines were temporal in nature. The articulation of matter consisted of temporal forces present in the atoms or molecules. The traces created by manual movements embedded particular kinds of duration, and the sequential numerical division of the line was rhythmical in terms of time.

The interrelationship between matter, style and rhythm are in my view temporal. In order to understand this temporality, we need to understand the relationship between matter, style and rhythm in terms of what Deleuze calls 'force' and what Grosz calls 'duration'. Stagoll suggests that for Deleuze, 'the enigmatic characterisation of forces is developed in Deleuze's account of their activity'.[74]

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[66] Klee, *Instruction Lessons by Paul Klee 9*, p. 57.
[67] Klee, *Instruction Lessons by Paul Klee 9*, p. 57.
[68] Klee, *Instruction Lessons by Paul Klee 9*, p. 58.
[69] Klee, *Instruction Lessons by Paul Klee 9*, p. 59.
[70] Paul Klee, 'The central opposition Dividual – Individual', *Paul Klee Notebooks, Volume 1, The Thinking Eye*, Jurg Spiller (ed.), Ralph Manheim (trans.), (London: Lund Humphries; New York: George Wittenborn, 1961), p. 237.
[71] Klee, 'The central opposition', p. 237.
[72] Klee, 'The central opposition', p. 237.
[73] Klee, "The central opposition', p. 237.
[74] Stagoll, 'Force', p. 107.

By understanding that 'no force can exist apart from its inter-relationship with other forces and, since such associations of struggle are always temporary, forces are always in the process of becoming different or passing out of existence, so that no particular force can be repeated'.[75] Klee's experimentation with the rhythm of the line consisted of a search for continuously changing inter-relationships. The changes through which rhythms of subdivisions, organisations of matter and manual traces passed can be thought of as concerned with the temporality of formation. Such a search for ever-evolving formations is close to what Grosz calls 'vitalism' where 'vitalism' is to be understood as a 'philosophical commitment to a specific life force, life energy which distinguishes organic from inorganic' and which is related to 'duration' and 'becoming'.[76] I believe that Klee's own experimental practice on the rhythm of the line involved close inter-digitalization of sections of time, the subdivision of matter, dividual and individual structures, all in search for such 'vitalism'.

Klee's understanding of whether a structure is 'individual' or 'dividual', depended on the 'criterion of indefinite extension of definite measure'.[77] For Klee, the 'symbol of dividuality' was present in 'the structural' element which he also saw in terms of ' indeterminate number'.[78] On the other hand he also believed that in the 'symbol of individuality [...] nothing is repeated, every unit is different from every other'. [79] In relating 'dividual' and 'individual' elements, I argue that Klee was representing the duration and vitality of structures in painting. Klee argued that repetitive elements within 'dividual' structures may be either 'line (measurement) or tone (weight)',[80] however, within an 'individual' structure, there may be 'individual stress (e.g. by difference in colour)' or 'negative stress on the individual (gaps, elimination)'.[81] Also, for Klee, in a dividual structure there is 'the question of indeterminate extension of the units (dividual=division)'.[82] On the other hand 'an individual structure is present when the concept is positively stated'.[83]

For Klee, the rhythm of the line is connected to the relationship between dividuality and individuality. Dividuality could be structured from an 'indeterminate extension of a two-part unit' while individuality could be structured from the 'determinate extension' of the same unit.[84] Dividuality is structured by 'rhythmic repetition' consisting of simpler or more complex units. Depending on the particularity of the units there may be different accents in the rhythm of the line. For example, lines that are 'bending' or 'breaking' possess another form of dividuality where rhythmical expression is made through 'our feeling about the obstacles we are facing'.[85] These obstacles could be compared to everyday experiences. In, for example, the experience

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[75] Stagoll, 'Force', p. 107.
[76] Elizabeth Grosz, 'Thinking the new: of futures yet unthought' in *Becomings: Explorations in Time, Memory and Futures*, Elizabeth Grosz (ed.), (Ithaca and London: Cornell University Press, 1999), pp. 22-4.
[77] Klee, 'The central opposition', p. 237.
[78] Klee, 'The central opposition', p. 237.
[79] Klee, 'The central opposition', p. 237.
[80] Klee, 'The central opposition', p. 237.
[81] Klee, 'The central opposition', p. 237.
[82] Klee, 'The central opposition', p. 237.
[83] Klee, 'The central opposition', p. 237.
[84] Klee, 'The central opposition', p. 237.
[85] Klee, 'The central opposition', p. 241.

of looking at water flowing over some pebbles which provide resistance to the continuous flow, the flow becomes interrupted by an obstacle (pebbles) and this results in the breaking of the flow. Taking examples from the everyday, Klee imagined that the rhythm of the 'flowing' line would be different if the obstacles were 'hard or soft' or, if they were 'solid or liquid'.[86] Such lines may possess different forms of 'repetitive accent on units', in which such lines are made up of 'higher and lower parts'.[87] These examples demonstrate Klee's understanding of rhythm in terms of matter and force, where the flowing force of the line may encounter an obstacle. In such an encounter between matter and force, a rhythmical repetition may be observed. However, if we turn to Deleuze, and his understanding of the world, we can understand according to Stagoll's interpretation that 'for Deleuze, the principal (and eternal) characteristic of the world of forces is different from whatever has gone before and from that which it will become'.[88] For Klee the world and painting is interconnected through intuiting the world through his optical and non-optical ways of seeing and transforming the forces, which he sees as visual intensities into the painting. Klee's own experimentation on the rhythm of the line captured such 'principal' and 'eternal' characteristics of the 'world of forces' present in the living world and transposed them into his creative practice. According to Robert Kudielka, 'Klee insisted upon the priority of the living connection with the creative process'.[89] Focusing on Klee's argument that the 'work of art [...] is first of all, genesis' Kudeilka suggests that 'Klee is the first great modern artist to state the basic temporality in the perception of painting'.[90] Referring to Klee's own words from the famous essay entitled *Creative Credo,* Kudeilka emphasises Klee's words: 'For space itself is a temporal concept'.[91] Kudeilka suggests that Klee's quest was in making this, what he calls 'universal process', visible in his paintings and suggests that this quest has been best represented in Klee's work done during the Bauhaus years when Klee worked out 'the opposition between an endlessly divisible continuum, which he called "dividual' and 'individual' form'.[92] What Kudeilka further suggests is that the relationship of dividual-individual was for Klee a process of 'realization', where 'genesis is not just an unlimited flux, but a force continually moving between formation and dissolution'.[93] Kudeilka's view of Klee's work as linked to 'genesis' points towards Klee's desire to work with movement, temporality, realization and new modes of visual actualization.

In understanding Klee's desire to represent time in the rhythm of the line while working with the process of realization and genesis present in the world, a parallel with Grosz's philosophical understanding of 'the process of realization' and 'process of actualization' is pertinent. For Grosz, 'the process of realization' is 'that "movement" or vector from the possible

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[86] Klee, 'The central opposition', p. 241.
[87] Klee, 'The central opposition', p. 241.
[88] Stagoll, 'Force', p. 106.
[89] Robert Kudielka, 'The central opposition dividual-individual-the formative process reflected in line and colour divisionism', *Paul Klee: The Nature of Creation/Works 1924-1940*, (London: Hayward Gallery and Lund Humphries, 2002), p. 103.
[90] Kudielka, 'The central opposition', p. 103.
[91] Paul Klee , 'Creative Credo', *Paul Klee Notebooks, Volume 1, The Thinking Eye*, Jurg Spiller (ed), Ralph Manheim (trans.), (London: Lund Humphries; New York: George Wittenborn, 1961), p. 78.
[92] Kudielka, 'The central opposition', p. 103.
[93] Kudeilka, 'The central opposition', p. 104.

to the real', and this 'is governed by the two principles of resemblance and limitation'.[94] 'Realization', according to Grosz, 'involves the process of limitation, the narrowing down of possibilities, so that some are rejected and others made real'.[95] Also, while stating that 'realization is a temporal process', Grosz also suggests that in this process, 'creativity and the new are no longer conceivable'.[96] However, Kudielka's concept of 'genesis' is closer to Grosz's interpretation of the creative process. For Grosz, the 'process of actualization is one of genuine creativity and innovation'.[97] Furthermore, what is particular to this process is that 'the lines of actualization of virtuality are divergent, creating multiplicities, the varieties that constitute creative evolution'. [98] What Grosz calls the 'movement of the emanation of multiplicity from virtual unity' is close to Klee's concerns with the rhythm of the line, where his aim was to create, different types of movement through the examples of his dividual – individual structures like in Grosz's terms 'divergent paths of development in different series and directions'.[99] Klee recognised that different series and directions were possible through structural changes that depended on the rhythm of lines. Klee saw opportunities in the rhythmical divisions of lines to represent movement, and treated the line as a material force in his quest for formation. In his numerous exercises concerned with the 'fundamental possibilities of movement with dividual-individual structure', he demonstrated different 'types and directions of movement' [100] through a variety of exercises. *(Fig. 3.19)* Such types of direction and movement depended on lines that could be divided into an infinite number of equal sections, or that could be divided in such a way as to show 'progressive change' with increasing or decreasing sections.[101] The line could also equally be divided but might be 'shifted' in relation to another line therefore suggesting a 'reverse direction', and again, a line could be 'alternating' in its rhythm, depending on different types of division.[102]

The whole structure of a painting and the overall process of its formation are defined through the kind of rhythm the line possessed, and its relation to other lines. For Klee, 'the concepts of change, uniformity, multiplication, and displacement are general structural concepts that both apply to dividual and individual forms'.[103] In the example of bricklaying, which for him is a type of ' a double three-part rhythm (six- part time)' *(Fig. 3.20)* Klee recognized that activities 'produce very definite structural forms which can observably become individual'.[104] Seeing the organisation of rhythmical elements in a similar way to bricklaying, Klee suggests that 'the characters may be more or less independent of one another' and that what is crucial is

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[94] Grosz, 'Thinking the New', p. 25.
[95] Grosz, 'Thinking the New', p. 25.
[96] Grosz, 'Thinking the New', p. 26.
[97] Grosz, 'Thinking the New, pp. 26-7.
[98] Grosz, 'Thinking the New, p. 27.
[99] Grosz, 'Thinking the New, p. 27.
[100] Paul Klee, 'Fundamental possibilities of movement with dividual – individual structure', *Paul Klee Notebooks, Volume 1, The Thinking Eye*, Jurg Spiller (ed.), Ralph Manheim (trans.), (London: Lund Humphries; New York: George Wittenborn, 1961), p. 245.
[101] Klee, 'Fundamental possibilities', p. 245.
[102] Klee, 'Fundamental possibilities, p. 245.
[103] Klee, 'Fundamental possibilities, p. 247.
[104] Klee, 'Fundamental possibilities, p. 247.

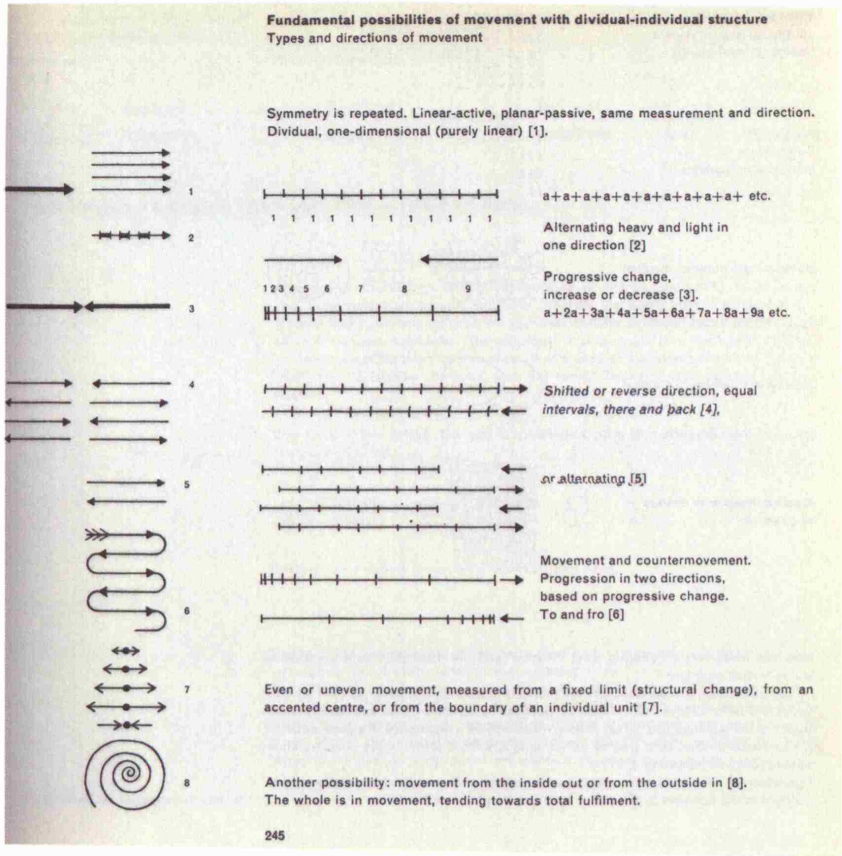


Fig. 3.19. Paul Klee, *Fundamental possibilities of movement with dividual – individual structure*, rpt. in *Paul Klee Notebooks, Volume 1, The Thinking Eye*, Jurg Spiller (ed.), Ralph Manheim (trans.), (London: Lund Humphries; New York: George Wittenborn, 1961), p. 245.

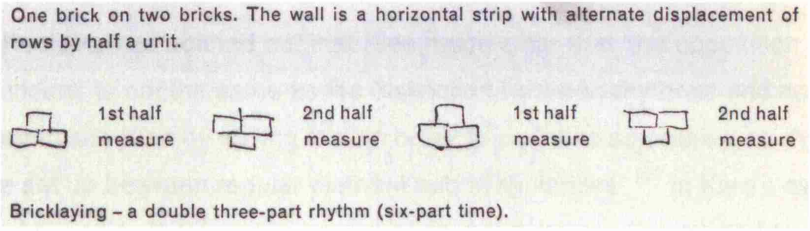


Fig. 3.20. Paul Klee, *Bricklaying - a double three-part rhythm (six part-time)*, rpt. in *Paul Klee Notebooks, Volume 1, The Thinking Eye*, Jurg Spiller (ed.), Ralph Manheim (trans.), (London: Lund Humphries; New York: George Wittenborn, 1961), p. 247.

'the positional relations between units'. [105] In the organisation of such types of units Klee believed it was also the case that 'quantity determines the structural impression', creating a relationship between 'major' ('an indeterminate number of structural units') or 'minor' ('the smaller, determinate number').[106]

Kudielka has pointed out that Klee made clear that 'the opposition between "dividual" and "individual" is not the same as the distinction between rhythmic and non-rhythmic'.[107] He also paraphrases Klee by saying that 'in order to perceive something as rhythmic, a balance has to be set up between regular element and irregularities'.[108] In Klee's own words, in a rhythmical structure there has to be a relationship 'between "norm" and "a-norm", between "major" dominant and "minor" variants'.[109] What Klee perceived as a rhythmic structure seems to lie in the 'tension' between different lines, - a 'repetitive structure' is 'perceived as rhythmic' when 'the eye brushes past line after line"'.[110]

In various examples of Klee's paintings, such as 'ARA Cooling in a Garden of the Torrid Zone' (1924) *(Fig 3.21)* the opposition between 'dividual' and 'individual' structures is set up as juxtaposition between sets of two differently and sequentially divided lines. The result of these compositions is rhythmical in the way that the repetitive structures are read and perceived like a sheet of music or block of text where, as in Klee's own words, 'the eye brushes past line after line'.

The idea of the eye 'brushing past' line after line for Klee comes directly from music and poetry, both of which in my view are temporal forms of art. Klee saw them as analogous to each other because of their 'notation on the printed page or music sheet'.[111] According to Klee, 'on both such pages the eye brushes past line after line' and so such a 'temporal reading of pictorial writing [can] be applied to our plane as well'.[112] In numerous examples of his creative work, Klee tried to achieve this form of rhythmical continuity and duration through drawing or painting. Kudielka states that 'all of Klee's rhythmic drawings and paintings' work by 'combining mechanical repetition with shifts of weight and character that are organic, prompted by handwriting, or arrived through intentional change'.[113]

In addition to understanding that the relationship between 'dividual' and individual' within a visual structure is one of juxtaposition, there is another made for such a relationship to

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[105] Klee, 'Fundamental possibilities, p. 247.
[106] Klee, 'Fundamental possibilities, p. 247.
[107] Robert Kudielka, '"Rhythms, cultural and natural"-the parallel of music and the metaphor of gardening', *Paul Klee: The Nature of Creation/Works 1924-1940*, (London: Hayward Gallery and Lund Humphries, 2002), p. 136.
[108] Robert Kudeilka, 'Rhythms, cultural and natural', p. 136.
[109] Robert Kudeilka, 'Rhythms, cultural and natural', p. 136.
[110] Robert Kudeilka, 'Rhythms, cultural and natural', p. 136.
[111] Paul Klee, 'From structural character to higher proportions; Higher proportions of changeable structural character; Comparative movement; Forming a higher articulation, linear and planar; Circulation as a finite temporal process; Relativity of articulate elements; The circulation of the blood as an example of figuration; Composite events with composite means', *Paul Klee Notebooks, Volume 2, The nature of nature*, Jurg Spiller (ed.), Heinz Norden (trans.), (London: Lund Humphries, 1973), p. 83.
[112] Klee, 'From structural character', p. 83.
[113] Robert Kudielka, 'Rhythms, cultural and natural', p. 137.

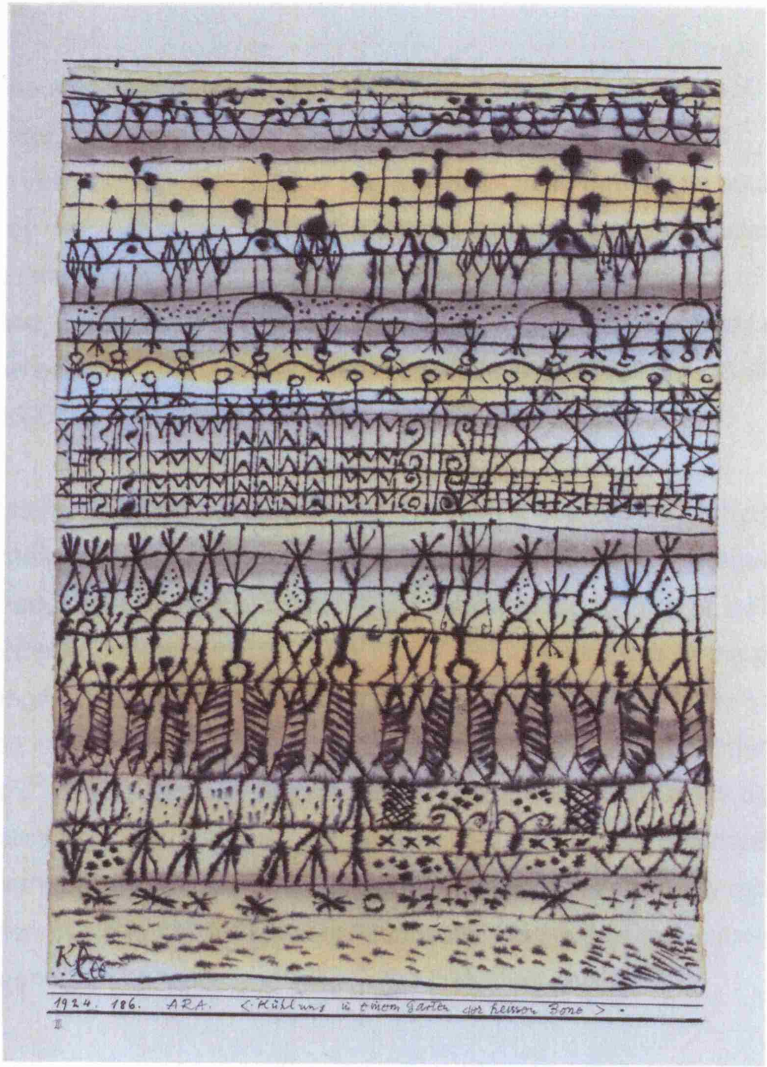

Fig. 3.21. Paul Klee, *ARA Cooling in a Garden of the Torrid Zone*, (1924), pen and watercolour on paper mounted on card, 29.6x20.7 cm, Offentliche Kunstsammlung Basel, Kupferstichkabinett, Endowment Richard Doetsch-Benziger, Inv. Nr. 1960.60, photo: Martin Buhler, rpt. in *Paul Klee: The Nature of Creation*, (London: Hayward Gallery in association with Lund Humphries, 2002), p. 143.

coexist – a synthetic one. In a synthetic combination two structures relate to each other through a particular combination of possible elements for example: 'dividual-individual', 'accented-unaccented lines', 'tone value-lines' and 'colour-tone value'.[114] Examples of synthetic rather than juxtaposed relationships can be found in Klee's painting 'Main Way and Byways' (1929). *(Fig. 3.22)*

Klee also distinguished natural rhythms from cultural rhythms. Cultural rhythms were present in the field of music where 'the basic structure lies in the beat'.[115] Analysing in detail one, two, three and four-part musical beats Klee focused on how he could obtain 'planar images of rhythm by watching a conductor'.[116] Kudielka suggests that 'the relationship between cultural and natural rhythms is emphasized by re-casting the movements of a musical conductor as drawing' and 'weightless configurations are derived from the movement of directing a three-time or four-time beat'.[117] This is evident in the example of Klee's picture 'Sailing Boats, Gently Moving' (1927). *(Fig. 3.23)*

Natural or cultural, Klee saw that 'the main characteristic of rhythm is repetition'.[118] For Klee this meant that 'every accentuation of movement modifies the regularity, tightens or relaxes, produces a positive or negative emphasis on the dividual or individual'.[119] Although closely connecting rhythm to time, Klee also became aware that 'in the pictorial field the passing of time brings with it a movement of the ground plane'.[120] One of Klee's main concerns was the 'articulation in time and in different kinds of movement gives rise to different orders of magnitude'.[121] Using a variety of strategies to depict temporality in his drawings and paintings, Klee deviated from the repetitive norm, and shifted the position of a rhythmical line in a painting. In other examples, Klee experimented with 'repetitive rhythm, steady movement' or 'the regular accentuation of the rhythmic repetition' that were 'modified by the intervention of a second active influence which lends and irregular or individual accent'.[122]

In the context of the rhythm of the line, Klee developed a variety of strategies to depict the processes of formation and temporality. The materiality of the line, the line's division and subdivision, the accentuation of the line, and the line's relational position in overall structure were all, for Klee, rhythmical strategies of duration and temporality in the formation process. However, one additional aspect we have yet to discuss was Klee's discussion of spatial dimensions. For Klee, the spatial dimension was achieved pictorially through colour.

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[114] Paul Klee, 'Dividual – Individual synthesis', *Paul Klee Notebooks, Volume 1, The Thinking Eye*, Jurg Spiller (ed.), Ralph Manheim (trans.), (London: Lund Humphries; New York: George Wittenborn, 1961), p. 260.
[115] Paul Klee, 'Cultural rhythms', *Paul Klee Notebooks Volume 1 The Thinking Eye*, Jurg Spiller, (ed.), Ralph Manheim (trans.), (London: Lund Humphries; New York: George Wittenborn, 1961), p. 271.
[116] Klee, 'Cultural rhythms', p. 273.
[117] Robert Kudielka, 'Rhythms, cultural and natural', p. 137.
[118] Paul Klee, 'Different possibilities of movement; Types of rhythmic structure; Terrestrial and cosmic examples', *Paul Klee Notebooks, Volume 1, The Thinking Eye*, Jurg Spiller (ed.), Ralph Manheim (trans.), (London: Lund Humphries; New York: George Wittenborn, 1961), p. 302.
[119] Klee, 'Different possibilities', p. 302.
[120] Klee, 'Different possibilities', p. 302.
[121] Klee, 'Different possibilities', p. 302.
[122] Klee, 'Different possibilities', p. 303.

Fig. 3.22. Paul Klee, *Main way and byways*, (1929) oil on canvas, 83.7x67.5 cm, Stadt+Koln, repro: Rheinisches Bildarchiv Koln, rpt. in *Paul Klee: The Nature of Creation*, (London: Hayward Gallery in association with Lund Humphries, 2002), p. 22.

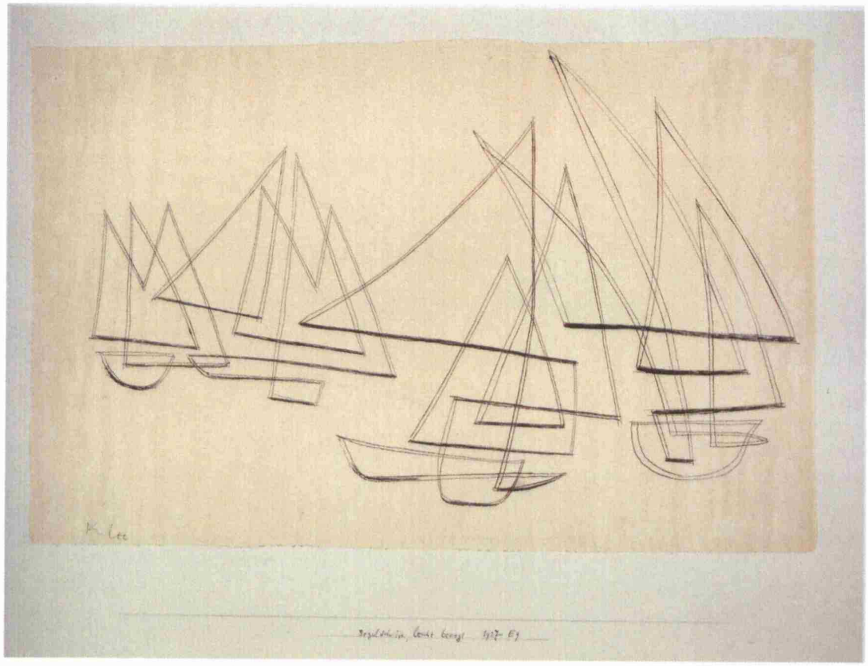

Fig. 3.23. Paul Klee, *Sailing boats, gently moving*, (1927), pen on paper mounted on card, 30.5x46.3 cm, private collection Switzerland, photo: Peter Lauri, Bern, rpt. in *Paul Klee: The Nature of Creation*, (London: Hayward Gallery in association with Lund Humphries, 2002), p. 155.

The dimension of the line in relation to tone and colour will be discussed in the following section.

### 3.3: DIMENSION OF THE LINE

> *We have a three dimensional space when tone value or colour is added to a linear plane figure.*[123]

Klee stated that 'the depth of our surface is imaginary' and that 'without the perspective viewpoint in space "the relations on the scene" have to be organised'.[124] Suggesting that space can be understood as 'relations on the scene' Klee alludes towards an understanding of space that considers the in-between of such relations. For Grosz, in-between relations in space are concerned not only with the 'relations between fixed identities' but also 'the in-between [...] of movement' and 'of development or becoming'.[125] In addition, for Grosz, 'the space in - between things is the space in which things are undone, the space to the side and around, which is the space of subversion and fraying, the edge of any identity's limits'.[126] For Klee, for the relations on the scene to be 'organised', an action, a possibility, or a potentiality of change and movement needs to be denoted. For Klee, the space of relations as a scene is a different space than a perspectival space. His attempts to create relations on the scene purely abstractly through line, tone and colour provide a space in which things change, become and move. However, before looking at movement in such space, we must first start with an analysis of what Klee considered to be the main dimensional elements.

One of the main dimensional elements in a picture, for Klee, was tone value. Klee saw tone value as closely related to weight. In his analysis of dimension and weight, Klee devised diagrams where he demonstrated that the density of dots could be used in order to depict the weight of the tone in terms of a grain. *(Fig. 3.24)* For Klee, the weight of the tone could be looked at in terms of 'density' and 'concentration' or 'thinness' and 'expansion'.[127] 'Heavy', for Klee, was equal to 'dense, tight, concentrated' while 'light' was equal to 'thin, expand, stretch'.[128] Klee devised a structural diagram of 'light' or 'heavy' in terms of 'grain', where one square of a diagram could have either 1 or 64 grains in terms of 'concentration' or one square could have 1/4 or 1/16 in terms of 'expansion'.[129] On the scale of 1 to 64, 1/64 is for white, which has the 'greatest sleaziness', 1 is for grey, which has 'normal density' and 64 for black, which has the 'greatest density' of dots per square unit.[130] *(Fig. 3.24)*

The changes of weight in terms of a tone value for Klee affected the dimensional space of a simple square diagram. Such dimensional changes could be 'expansion', 'implosion', as

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[123] Paul Klee, 'Endotopic – exotopic', *Paul Klee Notebooks, Volume 1, The Thinking Eye*, Jurg Spiller (ed.), Ralph Manheim (trans.), (London: Lund Humphries; New York: George Wittenborn, 1961), p. 53.
[124] Klee, 'Endotopic – exotopic', p. 53.
[125] Grosz, *Architecture from the Outside*, pp. 92-3.
[126] Grosz, *Architecture from the Outside*, p. 93.
[127] Klee, *Instruction Lessons by Paul Klee 9*, p. 40.
[128] Klee, *Instruction Lessons by Paul Klee 9*, p. 40.
[129] Klee, *Instruction Lessons by Paul Klee 9*, p. 40.
[130] Klee, *Instruction Lessons by Paul Klee 9*, p. 40.

well as the 'broadening' and 'narrowing' of pictorial space.[131] The weight changes could be seen as 'rarefaction', 'condensation', 'extension' and 'contraction'.[132] The situations which arose from combining different tone weights were numerous, and resulted in examples of 'equal weight at equal dimension', 'unequal weight at equal dimension' or 'unequal weight at unequal dimension'.[133] Considering that tone value was closely related to the density of grain Klee observed that 'when the whole, field by field, consisted of the same amount of pigment, the pigment wanes when the dimensions increase' but 'when the dimensions decrease, the pigment waxes'.[134]

The terms that Klee used to describe weight change such as 'extension', 'narrowing', 'contraction' and 'broadening' belong not only to the language of dimensional determinants but also to the language of spatial constituents. In juxtaposing such different spatial constituents, Klee appears to allude to an understanding of space as one 'of the bounding and undoing of the identities that constitute it'.[135] In terms of dimensional elements like line, tone and colour and strategies such as interaction, relations, 'genesis' and movement, Klee, through the process of formation, saw such space in terms of discovery. Similarly to Deleuze, Klee did not seem to see what Deleuze calls a 'general logic of space', but rather a space of relations, what Deleuze refers to as 'multiplicity'.[136]

According to Klee, 'large fields' are 'pigment poor' while small ones are 'pigment-rich'.[137] In suggesting that 'small fields become denser' and large fields more rarefied' Klee indicates that the 'interaction of dimension and weight in parallel or in the same direction underlines, emphasizes and reinforces any dimensional change'.[138] However, he also comments that 'oppositely directed interaction of dimension and weight impedes, cancels or reverses dimensional change by a counter-trend of density, according to the degree of energy applied'.[139]

In his theorem, Klee stated that 'weight is the degree of density of medium contrast'.[140] For Klee this meant that starting with a white, black or colourless base movement operates in terms of an 'enhancement' of the tone in the opposite direction from the base, for example, 'on a white base the enhancement marches in the direction of black' while on 'a black base enhancement marches in the direction of white'.[141]

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[131] Paul Klee, 'Dimension and weight and their movement', *Paul Klee Notebooks, Volume 2, The Nature of Nature*, Jurg Spiller (ed.), Heinz Norden (trans.), (London: Lund Humphries, 1973), p. 140.
[132] Klee, 'Dimension and weight', p. 140.
[133] Klee, 'Dimension and weight', p. 140.
[134] Klee, 'Dimension and weight', p. 141.
[135] Grosz, Architecture from the Outside, p. 93.
[136] Ian Buchanan and Gregg Lambert, 'Introduction', Ian Buchanan and Gregg Lambert (eds), *Deleuze and Space*, (Edinburgh: Edinburgh University Press, 2005), pp. 1 – 15, 7.
[137] Klee, 'Dimension and weight', p. 142.
[138] Klee, 'Dimension and weight', p. 142.
[139] Klee, 'Dimension and weight', p. 142.
[140] Klee, 'Dimension and weight', p. 142.
[141] Klee, 'Dimension and weight', p. 142.

In terms of a base or background there is also a 'major and minor relationship on the surface area'.[142] Klee thought of 'base' as a 'kind of minority, not used' and 'if there is something, even minimum on it' then 'that becomes vital'.[143] However, 'if there is more then one minimum, the base steps back from activity'.[144] In the example of black and white on the base the only relationship between the two is one where the black is 'major' and the white is 'minor'. *(Fig. 3.25)*

This 'marching' between tone and weight introduces movement in relation to dimension. Klee suggested that 'the step that the eye takes from a lighter inner point of the surface to a darker outer one presupposes motion from inside to out (or vice versa): from fore to rear'.[145] *(Fig. 3.26)* Such movements in terms of dimension and tone weight suggest for Klee spatial depth. Klee's own 'conception of a third dimension differs appreciably from the generally held notions of space and dimension'.[146] For Klee, such an understanding of space 'is based on space-time unit which covers completely every movement'.[147] He follows this by stating that 'motion is attained through the depth that tone value and colour give'.[148] According to Spiller, Klee clearly 'designates depth in a non-perspective space by using motion "from fore to rear"'.[149] This for Klee is 'the spatial expression of inside – outside in terms of motion and countermotion'.[150] *(Fig 3.27)*

The experiments that Klee carried out in relation to tone weight were concerned with understanding space outside a perspective viewpoint. In his exercises on the 'construction of space with a displaced centre', Klee suggested that 'change is based on extension or density and results in functional changes' and 'the displacement of the centre [is] brought out by tone value'.[151] *(Fig. 3.28)*

For Klee 'dimensional concepts' consist of the line which in turn is defined as 'what can be measured', 'tone value' defined as 'questions of weight', and 'colour' defined as 'quality'.[152] Klee however saw that in isolation all these dimensional elements have their limitations. Line is the dimensional element concerned with measure and, for Klee, is most limited in terms of dimension, since everything in relation to the line can be measured. However, measure, seen

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[142] Klee, *Instruction Lessons by Paul Klee 9*, p. 42.
[143] Klee, *Instruction Lessons by Paul Klee 9*, p. 42.
[144] Klee, *Instruction Lessons by Paul Klee 9*, p. 42.
[145] Paul Klee, 'Movement from black to white', *Paul Klee Notebooks, Volume 1, The Thinking Eye*, Jurg Spiller (ed.), Ralph Manheim (trans.), (London: Lund Humphries, 1961), p. 53.
[146] Klee, 'Movement', p. 53.
[147] Klee, 'Movement', p. 53.
[148] Klee, 'Movement', p. 53.
[149] Klee, 'Movement', p. 53.
[150] Paul Klee, 'Movement', p. 53.
[151] Paul Klee, 'Construction of a space with displaced centre', *Paul Klee Notebooks, Volume 1, The Thinking Eye,* Jurg Spiller (ed.), Ralph Manheim (trans.), (London: Lund Humphries, New York: George Wittenborn, 1961), p. 136.
[152] Paul Klee, 'Analysis of movement', *Paul Klee Notebooks, Volume 1, The Thinking Eye,* Jurg Spiller (ed.), Ralph Manheim (trans.), (London: Lund Humphries, New York: George Wittenborn, 1961), p. 218.

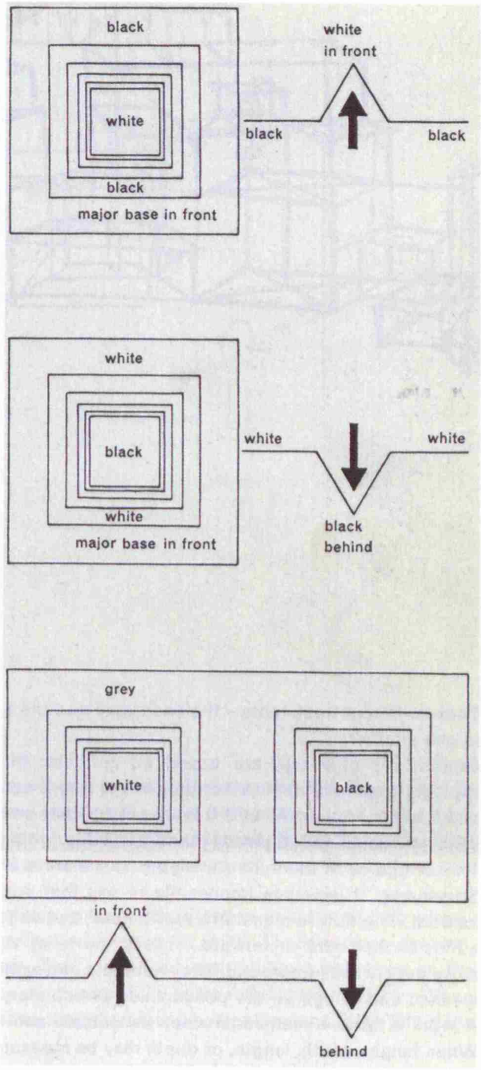


Fig. 3.26. Paul Klee, *Movement from black to white*, rpt. in *Paul Klee Notebooks, Volume 1, The Thinking Eye*, Jurg Spiller (ed.), Ralph Manheim (trans.), (London: Lund Humphries; New York: George Wittenborn, 1961), p. 53.

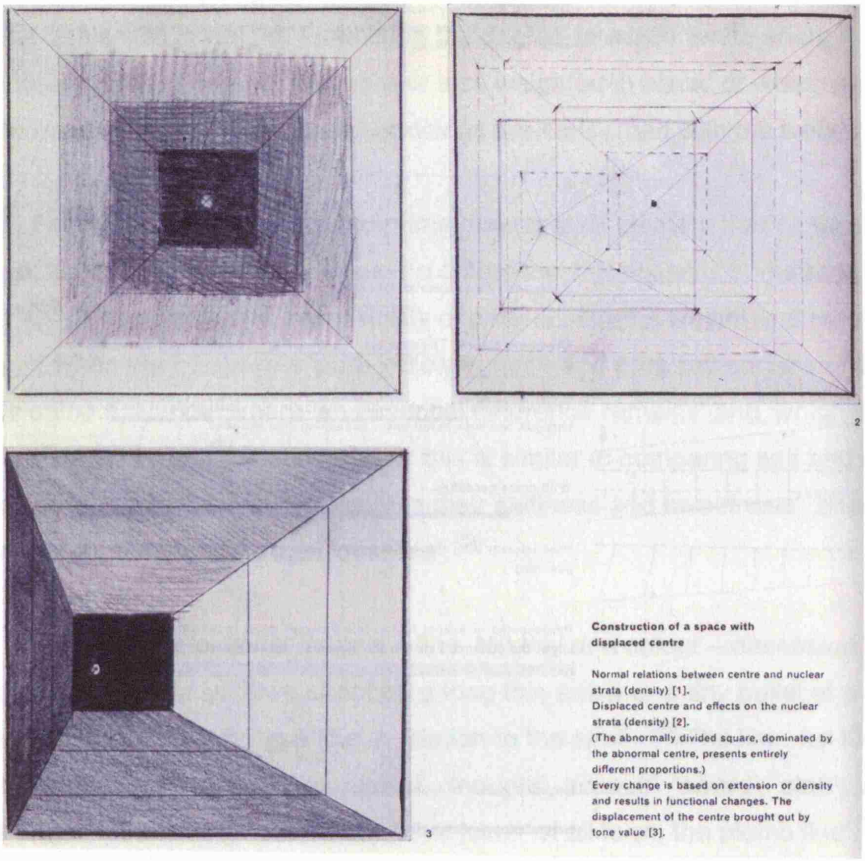


Fig. 3.28. Paul Klee, *Construction of space with displaced centre*, rpt. in *Paul Klee Notebooks, Volume 1, The Thinking Eye*, Jurg Spiller (ed.), Ralph Manheim (trans.), (London: Lund Humphries; New York: George Wittenborn, 1961), p. 136.

as the 'hallmark' of line, is very important for Klee because if 'the possibility of measurement is in doubt, line has not been treated with absolute purity'.[153]

The second dimensional element for Klee is tone value. Tone value, or 'chiaroscuro' he describes as 'the many degrees between black and white'.[154] Here the principle consideration that Klee deals with is weight. Examining the degree to which 'white energy' is 'more densely or more loosely packed' or another 'more or less weighted in black' or when 'one degree can be weighted against another' all these conditions are concerned with the weight of the tone.[155]

Finally, colour for Klee is the prime dimensional element that cannot be measured or weighed, 'where scales or ruler reveal no difference' but possess something that Klee calls 'quality'.[156] For example, the impossibility of determining the weight and measurement of colour is evident when we compare a 'pure yellow surface and pure red surface of the same extension and the same brilliance' where 'an essential difference remains' and 'which we designate by the words yellow and red'.[157] Klee suggests this is similar to comparing salt and sugar, which we can compare in every respect, 'except in their saltiness and sweetness', and it is exactly for this reason that Klee saw colours as 'qualities'.[158]

For Klee the 'pictorial means' – line, tonality and colour – dimension and space. Line, Klee describes spatially: 'if we shoot off a long thin arrow or a tiny bullet at a black spot from a distance, what we do is bring a line in relation to the spot'. [159] The line, for Klee, is also many other things, such as 'conducted current', 'thought', assault', 'sword', 'stab', 'arrow', 'ray', 'a knife's edge' 'scaffolding' and, finally, 'that joiner of all form, the plumb line'.[160]

Tonality for Klee is 'the range from light to dark' that moves 'up and down between poles of white and black'.[161] Tonality considers the energy of light in which Klee saw 'struggle' between white and black as inevitable where 'we do not merely meet the given dark with bright energy, but the given light with dark energy as well'.[162] Tonality 'becomes a force' only when 'its effects' stem from 'contrast'.[163] Between white and black, Klee introduced various 'tonal scales' where 'the natural unarticulated crescendo or diminuendo for an articulation of the up and down, for a ladder or scale'.[164] One of the numerous examples of tonal scale and density Klee gives as

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[153] Klee, 'Survey and orientation in regard to pictorial elements and their spatial arrangement', *Paul Klee Notebooks, Volume 1, The Thinking Eye,* Jurg Spiller (ed.), Ralph Manheim (trans.), (London: Lund Humphries; New York: George Wittenborn, 1961), p. 86.
[154] Klee, 'Survey and orientation', p. 86.
[155] Klee, 'Survey and orientation', p. 87.
[156] Klee, 'Survey and orientation', p. 87.
[157] Klee, 'Survey and orientation', p. 87.
[158] Klee, 'Survey and orientation', p. 87.
[159] Paul Klee, 'The pictorial means: line, tonality, colour', *Paul Klee Notebooks, Volume 2, The Nature of Nature*, Jurg Spiller (ed.), Heinz Norden (trans.), (London: Lund Humphries, 1973), p. 301.
[160] Klee, 'The pictorial means', p. 301.
[161] Klee, 'The pictorial means', p. 303.
[162] Klee, 'The pictorial means', p. 303.
[163] Klee, 'The pictorial means', p. 303.
[164] Paul Klee, 'Tonal scales', *Paul Klee Notebooks, Volume 2, The Nature of Nature*, Jurg Spiller (ed.), Heinz Norden (trans.), (London: Lund Humphries, 1973), p. 313.

the 'linear representation of a tonal scale with 9 dividing lines and step by step indication of the content of black and white'.[165] *(Fig. 3.29)*

Energy and force of tonality for Klee is best represented in the 'design of the black arrow' in his *Pedagogical Sketchbook.*[166] *(Fig. 3.30)* For Klee, 'the father of the arrow is thought' and 'the thought is medium between earth and the world' and through movement 'the arrow symbol combines all function in the pointy end'. [167] In the design of black arrow 'design consists of the increasing energy development of the present white, moving to the future of black'.[168] The movement from white to black has special significance as the white is familiar to the eye and is going to be absorbed by the eye without acclamation'.[169] However 'with the special contrast, the commencing action, the agility of the view is raised to the summit or the end of action' the black.[170] For this reason, the arrow for Klee goes from white to black and 'the growing of energy (in a productive sense) or of energy lost (in a receptive sense) is related to the direction of movement'.[171]

However, colour, while it might be subjected to the arrow like tonality, like the examples Klee gives of a 'chart of colour heating (mostly blue orange)' or a 'chart of colour cooling (mostly orange blue)'[172] is, for Klee, 'the infinite motion'.[173] Therefore, Klee skips the idea of arrow in relation to colour 'as it moves towards the infinite motion, where the moving direction becomes irrelevant' and where 'examples of heating and cooling are being combined'[174]. What Klee concluded was that the infinite motion present in changes of colour is best represented with 'spectral colour circle where arrows are not needed'.[175] For Klee, as far as colour is concerned, there is no single direction, or, rather 'there is no "over there', but "everywhere"'.[176]

In considering line, tone value and colour to be three main dimensional elements of pictorial space, Klee has outlined a theory of space that lies outside of perspective. Since perspectival drawing could be seen as linear drawing in which space is represented from an illusionary single positioned viewpoint, Klee suggested that his dimensional elements provide a different way of looking at space. Not only do Klee's examples of measure, weight and quality lead to forms of abstraction in the picture and an understanding of space as suggestive rather than representational, but such a position is also linked closely to materiality of the line. It is clear that Klee in this context treats a line as closely related to measure, while it is the colour that he values most and that gives the highest level of spatial distinction in the picture.

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[165] Klee, 'Tonal scales', p. 321.
[166] Klee, *Pedagogical Sketchbook [Pedagogisches Skizzenbuch]*, *Neue Bauhausbucher*, Kathrin Hassold (trans.), (Berlin: Gebr. Mann Verlag, 1997), p. 47.
[167] Klee, *Pedagogical Sketchbook*, pp. 44-5.
[168] Klee, *Pedagogical Sketchbook*, p. 47.
[169] Klee, *Pedagogical Sketchbook*, p. 47.
[170] Klee, *Pedagogical Sketchbook*, p. 47.
[171] Klee, *Pedagogical Sketchbook*, p. 47.
[172] Klee, *Pedagogical Sketchbook*, p. 49.
[173] Klee, *Pedagogical Sketchbook*, p. 50.
[174] Klee, *Pedagogical Sketchbook*, p. 50.
[175] Klee, *Pedagogical Sketchbook*, p. 51.
[176] Klee, *Pedagogical Sketchbook*, p. 51.

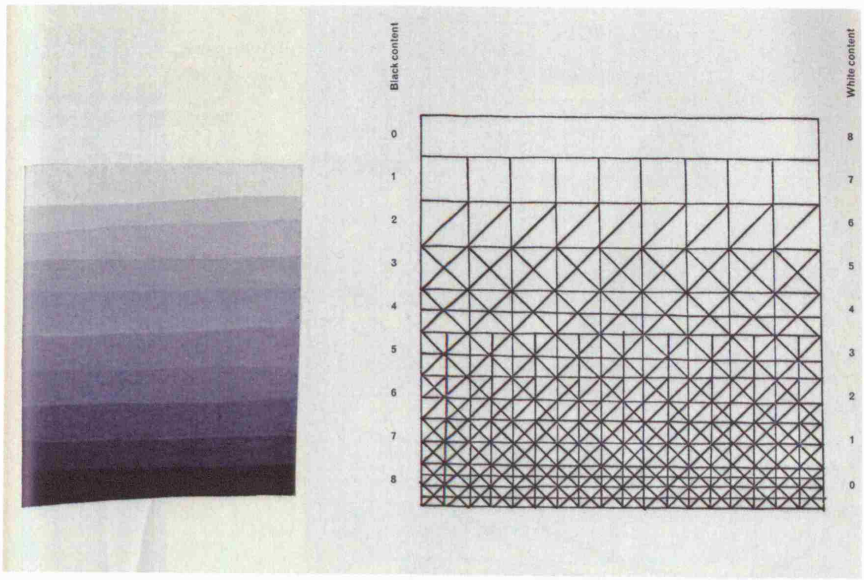


Fig. 3.29. Paul Klee, *Linear representation of tonal scale with 9 dividing lines*, *Paul Klee Notebooks, Volume 2, The Nature of Nature*, Jurg Spiller (ed.), Ralph Manheim (trans.), (London: Lund Humphries, 1973), p. 321.

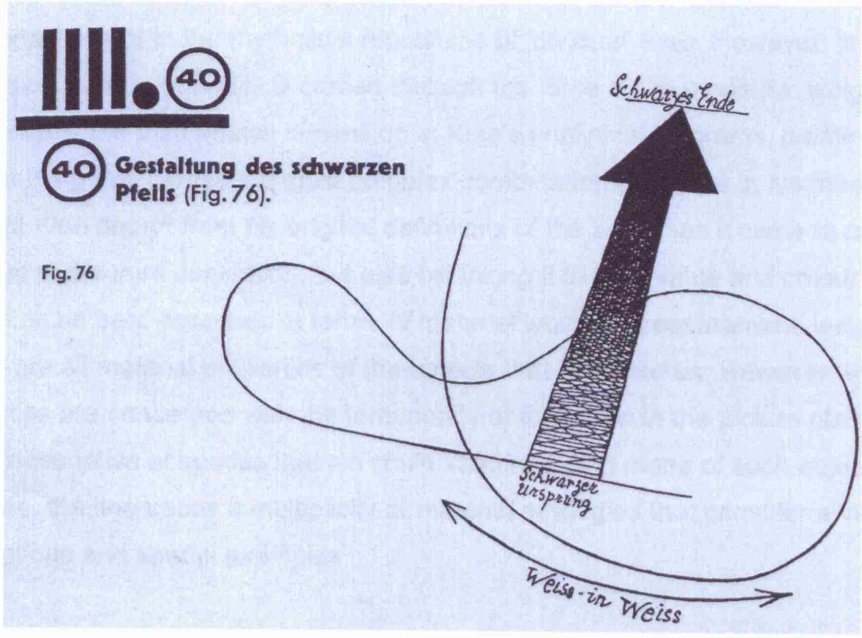


Fig. 3.30 Paul Klee, *Design of the black arrow*, rpt. in *Paul Klee, Pedagogical Sketchbook [Pedagogisches Skizzenbuch]*, Kathrin Hassold (trans.), (Neue Bauhausbucher, Gebr. Mann Verlag, Berlin, 1997), p. 47.

However, we have seen that through his analysis of active, passive and middle lines, a coloured surface could be seen as series of so-called passive lines.

One particular aspect of Klee's view on spatiality is that a temporal condition is always present in a spatial one. We have seen that this temporality is present in the movement of functional lines or in the rhythmical repetitions of 'dividual' lines. However, in the context of dimension such temporality is carried through the force of the measure, weight or quality. In other words, the third spatial dimension in Klee's analytical diagrams, painting opus and writing is something that carries the most complex combination of factors in his theory of formation. Not only did Klee depart from his original definitions of the line when it came to considering it as an element of the third dimension, but also by linking it to tone value and colour he created a triad that could be best described in terms of material words – measurement, weight and quality. These are all material properties of the objects that surround us. However, while these properties are concerned with the temporality of formation in the picture plane, they are also highly descriptive of spaces that we could imagine being made of such objects or atmospheres. For Klee, the line traces a multiplicity of material strategies that consider a variety of material descriptions and spatial examples.

## 4.0: THE IMMATERIALITY OF THE LINE

*Space creation is not primarily a question of the building material.*[1]

In 1922, Laszlo Moholy-Nagy described ordering by telephone five artworks made of porcelain enamel from a sign company. He had the company's colour scheme in front of him while sketching images on graph paper and talking to the director of the company who had the same squared paper in front of him whilst he was taking instructions from Moholy-Nagy. Giving instructions over the telephone as to how the porcelain enamel works were to be executed, Moholy–Nagy suggested that one of them was to be delivered in three different sizes so that decisions could be made concerning the fine differences of colour gradation. Although there is some doubt as to the event itself,[2] using a telephone to order an artwork represented a visionary experiment. Obtaining artworks at distance through a medium of communication, the so-called 'Telephone Pictures' *(Figs 4.1, 4.2)* and were undeniably a novel way of producing art.

Art historian Krisztina Passuth has suggested that 'the idea of the artist not participating directly in the creation of his own work was originally put forward by the Dadaists', and in 'recalling the spirit of Marcel Duchamp's ready-mades'.[3] Passuth argues that Moholy-Nagy in 1920-22 'was feverishly searching for a new style, for his own mode of expression and place among the many avant-garde trends'.[4] Passuth also suggests that 'the intellectual background of the telephone pictures was not confined to Dadaism; on the contrary, it was principally related to the theory of Soviet Constructivism'.[5] According to Passuth, Moholy-Nagy was aware of the aim of Soviet Constructivists in 1922 whose goal was 'to design artistic-industrial objects themselves and to make prototypes which could be later mass-produced'.[6] Passuth further suggests that 'theoretically, the telephone pictures are able to be reproduced and manufactured in a series'.[7] This is, according to Passuth, what 'Moholy-Nagy was probably thinking when he ordered them, one of each, from the factory'.[8] However, since there were only six of them they remained an experiment, but one that brought to the fore a different way of producing an art object. The 'Telephone Pictures' were pioneering in suggesting that 'art in the industrial age could consist of an anonymous machine process of high precision and exist independently of the personal intervention of the artist's hand' Moholy-Nagy's experiment demonstrated,

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[1] Laszlo Moholy-Nagy, *The New Vision and Abstract of an Artist*, [1928] (New York: George Wittenborn, fourth revised edition, 1947), p. 62.
[2] Lucia Moholy, the artist's first wife, in her book 'Marginal Notes' suggested that Laszlo Moholy-Nagy was so satisfied with industrially-produced artworks that he ordered them by phone. See Rainer K. Wick, *Teaching at the Bauhaus,* (Ostfildern - Ruit: Hatje Cantz), p. 134. On the other hand, Adriana de Souza e Silva quotes Eduardo Kac who suggested that it is uncertain if the story of how the 'Telephone Pictures' were ordered is true in view of his first wife's claims that *she* ordered the artworks. Adriana de Souza e Silva, 'Art by telephone: from static to mobile interfaces', <http://sea.search.msn.com/preview.aspx?&q=Art+by+telephone>, and <http://www.turbulence.org/blog/archives/000815.html>. 20 June 2005.
[3] Krisztina Passuth, *Moholy-Nagy*, (London: Thames and Hudson, 1985), pp. 31-2.
[4] Passuth, *Moholy-Nagy*, pp. 31-2.
[5] Passuth, *Moholy-Nagy*, p. 32.
[6] Passuth, *Moholy-Nagy*, p. 32.
[7] Passuth, *Moholy-Nagy*, p. 33.
[8] Passuth, *Moholy-Nagy*, p. 33.

according to Wick, that 'the act of artistic creation should be seen in the intellectual aspect and not in the manual one'.[9]

In Wick's view, the 'Telephone Pictures' experiment is somewhat emblematic of Moholy-Nagy's work in general in its separation of what might be called 'conceptual work' and 'material execution'.[10] Wick drew his comments on this separation from the research of Andreas Haus who, in his analysis of Moholy-Nagy's photographic oeuvre, has explicitly alluded to this separation in Moholy-Nagy's work:

> *He sought to eliminate completely all-material work [...] and transposed the process of 'design' into the intellectual disposition of 'preparation'. In doing so he was performing as an artist the equivalent of the separation of manual and intellectual labour found in modern technological production.*[11]

In addition, Haus suggests that 'whereas until then [the early twentieth century] the artist was still bearer of an ideology of 'identical' and thus un-alienated work, Moholy enthusiastically turned over to mechanical means the process of actually shaping the material and instead merely designed its application'.[12] By eliminating the shaping of materials and replacing this with a concept or process of 'preparation' for design, suggests that Moholy-Nagy's work not only demonstrates an 'escape' from the material, but in so doing redefined artistic practice.

Various different ways of dematerialising an object are present in Moholy–Nagy's work. For example, in discussing volume in the context of sculpture, Moholy-Nagy claimed that the so-called 'fifth-kinetic stage'[13] of sculptural development from the standpoint of the treatment of material is the one in which 'the volume relationships are virtual ones, i.e., resulting mainly from the actual movement of the contours, rings, rods, and other objects'.[14] Moholy-Nagy further suggested that 'a similar quest for expression by subduing or lightening the material is to be found [...] in sculpture: from mass to motion; in painting: from coloured pigment to light (display of coloured light); in music: from instrumental tones to electronic purity (ether wave music); in poetry: from syntax and grammar relations to single words; in architecture: from restricted closed spaces to free fluctuation of forces'.[15]

Moholy-Nagy tried to depict the strategy of breaking up a volume into elements and focusing on relationships between these elements in his diagram 'Volume and space relationships' *(Fig. 4.3)*. He suggests that when 'the side walls of a volume (i.e. a clearly

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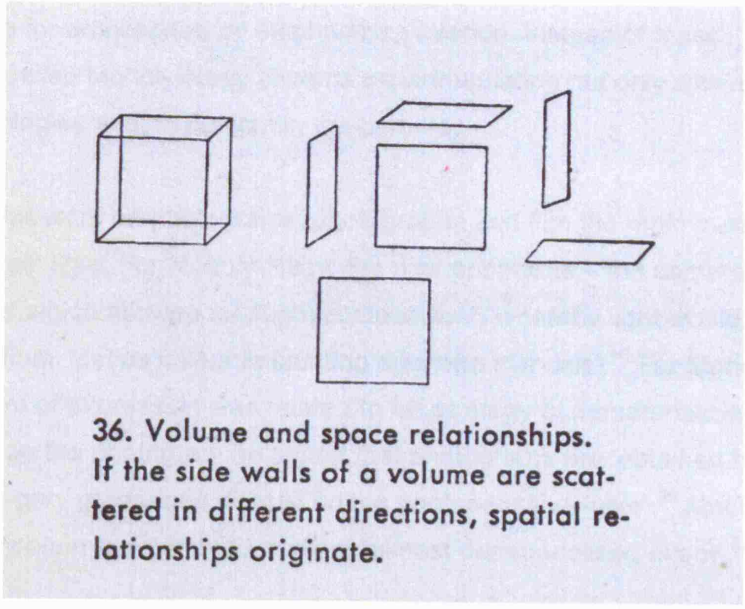
[9] Wick, *Teaching at the Bauhaus*, p. 134.
[10] Wick, *Teaching at the Bauhaus*, p. 134.
[11] Rainer K. Wick quotes Andreas Haus from *MN : Fotos and Fotogramme*. See Wick, *Teaching at the Bauhaus*, p. 134.
[12] Wick, Teaching at the Bauhaus, p. 134.
[13] Moholy-Nagy, *The New Vision*, p. 47.
[14] Moholy-Nagy, *The New Vision*, p. 48.
[15] Moholy-Nagy, *The New Vision*, p. 48.



36. Volume and space relationships. If the side walls of a volume are scattered in different directions, spatial relationships originate.

Fig. 4.3. Laszlo Moholy-Nagy, *Volume and space relationships*, rpt. in Laszlo Moholy-Nagy, *The New Vision*, (New York: George Wittenborn, Inc., fourth revised edition, 1947), p. 58.

circumscribed body) are scattered in different directions, spatial patterns or spatial relationships originate'.[16] For Moholy-Nagy, 'the real spatial experience rests on the simultaneous interpenetration of inside and outside, above and beneath, on the communication of in and out, on the often invisible play of forces present in the materials and their relationships in space'.[17] Furthermore, for Moholy-Nagy, 'material is energy' and in his view this 'will have significance for architecture by emphasizing relation, instead of mass'.[18] Seeing material as energy propelled Moholy-Nagy towards experimentation not only with new mediums but also new technologies and, in particular, the camera.

In his work on photograms, photographs and film the main medium is the least material medium of all: light. For Moholy-Nagy, the new apparatus – the camera – was 'based on new optical laws' which allowed for '"light composition", whereby light would be controlled as a new plastic medium, just as colour in painting and tone in music'.[19] For Moholy-Nagy capturing light as a medium of expression was related to his strategy of dematerializing the material. In his discussion on the photogram he stated that photograms are 'obtained by fixing light effects in black-white-grey gradations directly on the photosensitive layer'.[20] Moholy-Nagy used this process to 'obtain a sublimated, radiant, almost dematerialized effect'.[21]

Dematerializing objects and searching for spatial relationships started early in Moholy-Nagy's career. Describing his beginnings as a painter in his essay 'Abstract of an Artist' Moholy-Nagy sought to express space through relationships using lines. Sometime between 1917 and 1919, when he was exploring the way that other artists used lines, Moholy-Nagy made a drawing without objects but only lines, both straight and curved. The drawing was called 'Build! Build' *(Fig. 4.4)* and attempted to produce lines as 'diagrams of inner forces'.[22]

> *Through my 'problem' of expressing everything only with lines I underwent an exciting experience, especially as I over emphasized the lines. In trying to express three-dimensionality, I used auxiliary lines in places where ordinarily no lines are used. The result was a complicated network of a peculiar spatial quality, applicable to new problems.[...] I tried to analyze bodies, faces, landscapes with my 'lines', but the results slipped out of my hand, went beyond an analytical intention. The drawings became a rhythmically articulated network of lines, showing not so much objects as my excitement about them.[...] I learned that the manner in which lines are related, not objects as such, carry the richer message.*[23]

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[16] Moholy-Nagy, *The New Vision*, pp. 60-1.
[17] Moholy-Nagy, *The New Vision*, p. 62.
[18] Moholy-Nagy, *The New Vision*, p. 61.
[19] Laszlo Moholy-Nagy, 'Light - A Medium for Plastic Expression', (originally published in *Broom*, IV, No. 4 (1923) rpt. in Krisztina Passuth, *Moholy-Nagy*, (London: Thames and Hudson, 1985), pp. 292-3.
[20] Laszlo Moholy-Nagy, 'Photography is Creation with Light', originally published as 'Fotografie ist Lichtgestaltung', *Bauhaus*, II/1 (1928), trans. version in Krisztina Passuth, *Moholy-Nagy*, (London: Thames and Hudson, 1985), p. 302.
[21] Moholy-Nagy, 'Photography is Creation with Light', p. 302.
[22] Passuth, *Moholy-Nagy*, p. 71.
[23] Passuth, *Moholy-Nagy*, p. 68.


Fig. 4.4. Laszlo Moholy-Nagy, *Build! Build!*, (1919), rpt. in Laszlo Moholy-Nagy, *The New Vision*, (New York: George Wittenborn, Inc., fourth revised edition, 1947), p. 71.

In other words, for Moholy-Nagy, the relationship between lines allowed for new connections to be made between the dematerialised forms. The dematerialising strategies he employed were various. In painting, they were achieved through what he called auxiliary lines. In photograms, dematerialisation occurred through captured light, which created elements that floated on a black background. In photographs, unusual views produced new spatial effects and in the case of film, juxtapositions of light and shadow in motion produced an effect of dematerialization of the background surface. Each of these dematerialization strategies demanded from the viewer a conceptual engagement with dematerializing elements in order for the viewer to create spatial relationships through his/her own intellectual thought-process. The immaterial nature of the line in the dematerialisation strategies of Moholy-Nagy's experiments is a line that traces a relationship that generates a new conception of space, and which further creates new connections outside of the image itself.

If we return to architectural theorist Catherine Ingraham whose ideas were introduced in **Section 1.1: Lines Outside of Architecture**, in **Chapter 1.0: Question Lines**, we remember that Ingraham's position is to understand linearlity in terms of conceptual mobility. I would like to suggest that this is similar to Moholy-Nagy demanded from the viewer of his dematerializing forms. By observing his dematerializing forms, Moholy-Nagy provoked the viewer to create new spatial relationships by drawing immaterial lines of thought. In fact, what Moholy-Nagy demanded the viewer to conceptualize space not only through observation but also through intellectual activity.

Moholy-Nagy's focus on the role of intellectual activity in the conceptualization of space connects to the point in Ingraham's argument where she draws our attention to Alberti's view of the beginnings of architecture in which 'architecture begins with the *lineaments*, the outline of the architectural project in mind'[24] and the 'act of conceptualizing a building'.[25] What Ingraham suggests in reference to Alberti is that looking at lines as an intellectual act provides for an understanding of 'the joining and the fitting together of lines in the geometric imagination, and the outline of the building that results are outside the material, or bodily, play of parts'.[26]

The intellectual activity that happens in the mind and through imagination, for me, suggests that there are immaterial forces outside of materiality of architecture. These immaterial forces are able to create an immaterial line of influence that impinges on architecture. I would like to define this as the immateriality of the line, and connect it to Elizabeth Grosz's ideas of 'virtuality'. For Grosz 'outside' architecture lie the provinces of what she calls 'virtuality' and

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[24] To make her argument Catherine Ingraham uses Joseph Rykwert's comments in the glossary to Alberti's text in Leon Battista Alberti, 'On the Art of Building in Ten Books', (trans.) Joseph Rykwert, Neil Leach, and Robert Tavernor, (Cambridge Massachusetts: The MIT Press, 1998), pp. 422-423. See Catherine Ingraham, *Architecture and the Burdens of Linearity*, (New Haven and London: Yale University Press, 1998), pp. 58, 168.
[25] Ingraham, *Architecture and the Burdens of Linearity*, p. 59.
[26] Ingraham, *Architecture and the Burdens of Linearity*, p. 59.

which she defines as 'thought' and 'life'.[27] For Grosz, this is 'space outside the actual which is filled with virtualities, movements, trajectories that need release'.[28] What Grosz means by 'outside' is not only the 'outside as the edifice or exterior of a building', but also 'a broader notion of the outside of architectural discipline itself – a spatial as well as non-spatial outside'.[29]

In this chapter I discuss various immaterial aspects of the line by examining Moholy-Nagy's work. I suggest that the line's immateriality can be understood in terms of the production of different kinds of line that take into account conceptual activity as well as bodily action. Practising such immateriality, for example in Moholy-Nagy's work on the photogram, combines the absence of manual labour and the fixing of the temporality of light to demonstrate the object. Such an immaterial line for me can be understood as a line of thought if one considers the artist's conceptual preparation for the work in terms of the execution of the material outcome. In the photogram this conceptual preparation captures the light, an invisible matter that surrounds us like life and thought. I aim to draw parallels with Grosz's arguments on virtuality by suggesting that the line in a photogram is a virtual line. This I shall discuss in **Section 4.1: The Virtual Line**.

Another aspect of the immateriality of the line may be found in Moholy-Nagy's photographs produced by taking pictures from above and below the eye's usual focus, which for me invite an anticipatory response from the viewer. I argue that these photographs provoke anticipation in the observer because of the particular position of the photographer when taking them and their particular subject matter, which may be linked to either a moment of time or duration. This will be discussed in **Section 4.2: An Anticipatory Line.**

Finally, I see the immateriality of the line as a line's ambiguity. The drawn line sometimes may allude to a narrative or provoke thoughts of experienced sensations and ideas. This is what I believe is suggested by Moholy-Nagy's experiments on photoplastics. In particular, the drawn lines that visually connect the cut-out photographs in the photoplastics are for me the most immaterial lines in these works since they provoke speculation and association. They will be discussed as ambiguous lines in **Section 4.3: The Ambiguous Line**.

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[27] Elizabeth Grosz, *Architecture from the Outside: Essays on Virtual and Real Space*, (London, England; Cambridge Massachusetts: The MIT Press, 2001), p. 70.
[28] Grosz, *Architecture from the Outside*, p. 70.
[29] Grosz, *Architecture from the Outside*, pp. 70-1.

## 4.1: THE VIRTUAL LINE

*In the photogram, finally it is the light that does the work.*[30]

The work produced in Moholy-Nagy's 'Telephone Pictures' and photograms share similar sorts of immateriality. Telephone communication is an example of displacement of the manual labour away from the artist and refocusing the artist as the thinker. Similar displacement of manual labour happens in the photograms in which 'the light does the work'. While both share the absence of the manual and tactile labour of the artist's hand present in traditional painting and sculpture, the artist's presence remains through the input of his or her thought and ideas. What is absent in these artworks is the action of the artist's body and the contact that we expect between an artist, a tool and a material in an artwork, for example a painter, a brush, paint and canvas, or an architect's pencil and a piece of paper.

Moholy-Nagy saw how photograms could produce new forms of line. For Moholy-Nagy, the photogram was a new form of painting in which the process of capturing light replaced the material line produced by pigment. In painting, as Moholy-Nagy suggested, 'coloured matter was able to reflect or absorb light', and 'it was used for the formation of a visual effect that was supposed to represent the world through the play of light'.[31] However, in the photogram as Moholy-Nagy states: 'direct light radiation can produce a far more intensive effect [...] once it is mastered to the same extent as pigment.[32] For Moholy-Nagy 'the photogram appears to be a bridge leading to a new visual creation for which canvas, paint-brush and pigment cannot serve'.[33] In addition he states that 'in the case of photogram the coarse pigmented material forms are absent; the materialization of light, hitherto secondary, becomes more direct'.[34] In other words, while a painting represents a world washed in light, a photogram makes the invisible immaterial light itself visible.

'The Mirror – Photogram No. 1' (1929) *(Fig. 4.5)* is one of the very early photograms, the gelatine silver print which is kept in J. Paul Getty Museum archive. The print in the archive was made for the 1929 Film and Photo exhibition in Stuttgart, but the original was made possibly as early as 1922-3. This print has raised an interesting discussion concerning the production of work among academics and connoisseurs of Moholy-Nagy's work.[35]

The discussion was concerned firstly with the title of the photogram. The title of the photogram 'The Mirror – Photogram No. 1' (1922-23) suggests that the shapes which were

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[30] Rainer K. Wick quotes from Andreas Haus *MN : Fotos and Fotogramme*. See Wick, *Teaching at the Bauhaus*, p. 134.
[31] Laszlo Moholy-Nagy, 'Photogram and Frontier Zones' ('Fotogram und Grenzgebiete', i10, Nos 21/22, [1929], pp.190-192.) rpt. and trans. in Passuth, *Moholy-Nagy*, p. 30.
[32] Passuth, *Moholy-Nagy*, p. 305.
[33] Passuth, *Moholy-Nagy*, p. 305
[34] Passuth, *Moholy-Nagy*, p. 305.
[35] This discussion occurred during a colloquium at J. Paul Getty Centre in 1994. Weston Naef, (ed.), *Laszlo Moholy-Nagy In Focus, Photographs from the J. Paul Getty Museum*, (Malibu California: J. P. Getty Museum, 1995).

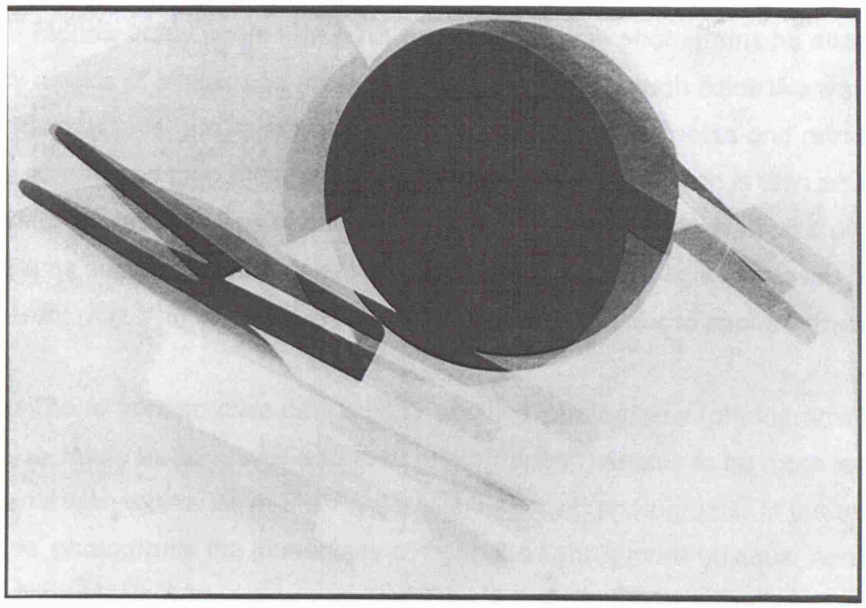

Fig. 4.5. Laszlo Moholy-Nagy, *Photogram Number 1 - the Mirror*, negative (1922 – 23); print (1928), gelatin silver print 63,8x92,07 cm, 84.XF.450. (http://www.getty.edu/art/collections/objects/o39033.html), 20 June 2005.

used to make this photogram were made from circular-looking glass that reminds one of a mirror. This guess concerning the origin of the forms is informed by some of Moholy-Nagy's articles, where he states that he used mirrors, lenses and other translucent objects to create gradations of light, which create more interesting effects than silhouettes.

Moholy-Nagy wrote that in his experiments with photograms he attempted to control light 'by means of lenses and mirrors, by passing light through fluids like water, oil acids, crystal, metal, glass, tissue, etc.' and this meant that 'the filtered, reflected and refracted light is directed upon a screen and then photographed'.[36] Photogram 'The Mirror' is also an example of a 'positive' photogram whose negative was photographed. Other examples of 'positive' photograms suggest similar strategies to 'The Mirror' where light is passed through either transparent *(Fig. 4.6)* or textured *(Fig. 4.7)* materials in order to capture gradations of light.

The form of practice deployed in 'positive' photograms (photograms that were previously made as negatives and then photographed) seems to be more laborious and less immaterial than examples of Moholy-Nagy's 'negative' photograms. In the examples of 'negative' photograms the immediacy of fixing the light is more obvious. Achieved either through positioning objects *(Fig. 4.8)* or cut-outs *(Figs 4.9, 4.10)* these 'negative' photograms produce more dematerialized, floating and abstract effects.

The lines in the photogram produced by capturing light can be seen as a form of virtuality that can sometimes create the effect of an illusion, to suggest an image unrelated to the original material, such as in the example of the so-called 'Photo greeting' (1928) *(Fig. 4.11)* and Moholy-Nagy's 'Self-portrait from the side' (1925-27). *(Fig. 4.12)* At other times the photograms appeared to suggest architectural references such as plans or models. *(Figs 4.13, 4.14)*

The captured light in the photogram produced a dematerializing effect, which often produced an image very different from the original material used to produce the photogram. For Moholy-Nagy the photogram was the 'most dematerialized medium'.[37] According to Geraldine Johnson, 'for Moholy-Nagy, photograms effectively gave a fixed, material presence to light itself, while denying the specific materiality of the objects used in the process'.[38] Moholy-Nagy himself stated that the process used in creating photograms (placing objects on light sensitive paper and exposing them to different sources of light) had, in the end, 'nothing anymore to do with original material'.[39]

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[36] Laszlo Moholy-Nagy, 'Light – A Medium of Plastic Expression', *Moholy-Nagy: An Anthology*, Richard Kostelanetz (ed.), (New York: A Da Capo, 1970), p. 118.
[37] Passuth, *Moholy-Nagy*, p. 326.
[38] Geraldine A. Johnson, 'An almost immaterial substance: photography and dematerialization of sculpture', in *Brancusi Gabo Moholy-Nagy Immaterial:*, 17 January – 14 March 2004, (exhibition catalogue, Cambridge, England: Kettle's Yard publications, 2004), p. 77.
[39] Katherine Ware, 'Introduction', *Laszlo Moholy-Nagy: Photographs in the J. Paul Getty Museum*, (Malibu, California: The Museum, 1995), p. 12.

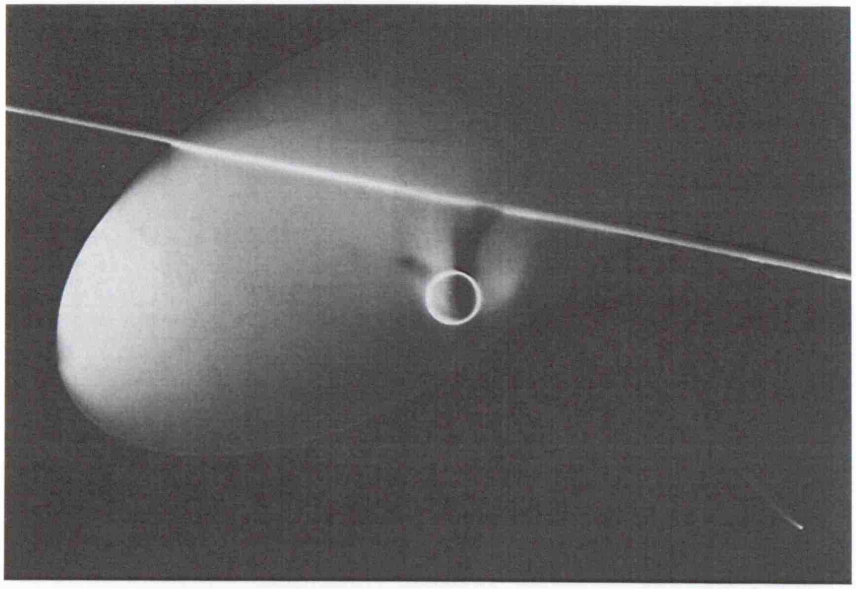

Fig. 4.8. Laszlo Moholy-Nagy, *Photogram*, (1923), gelatin silver print, image: 17,54x12,22 cm, 84.XM.997.62. (http://www.getty.edu/art/collections/objects/o53152.html), 20 June 2005.

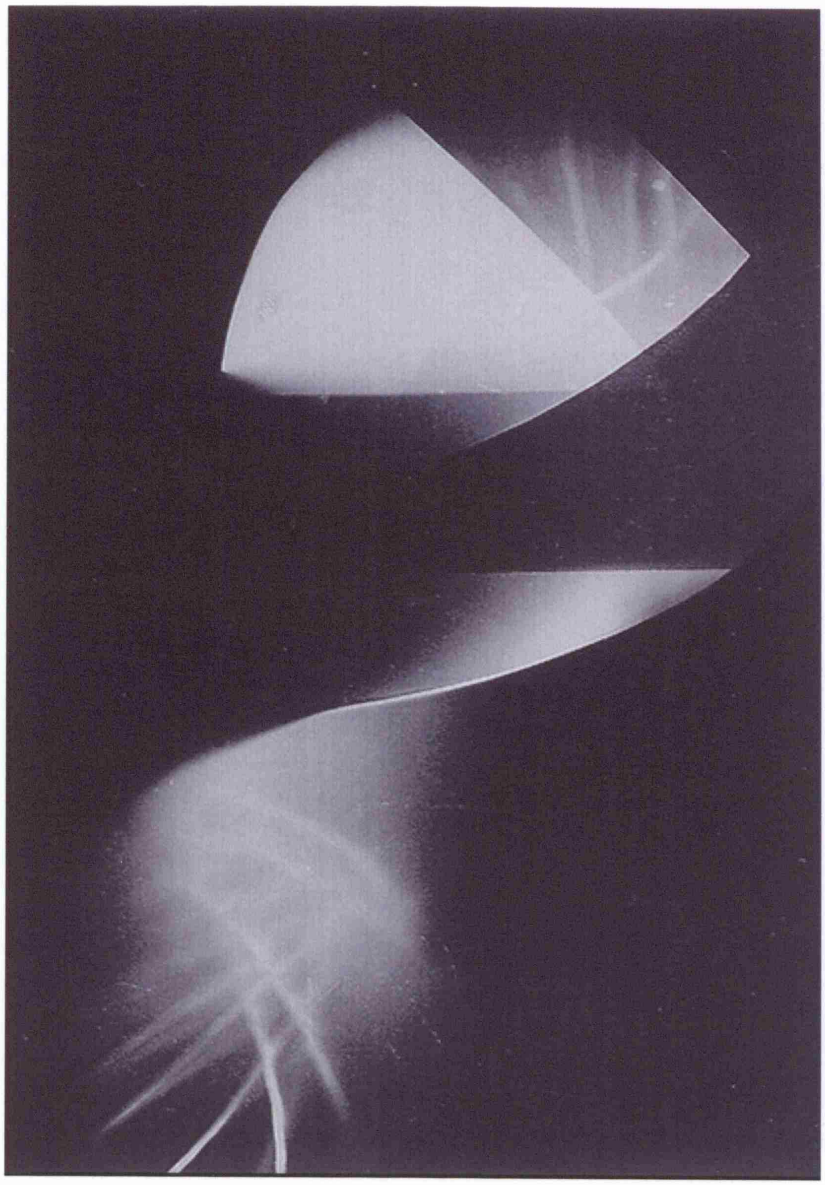

Fig. 4.9. Laszlo Moholy-Nagy, *Photogram without title, [Photogramme sans titre],* (1923 – 29), [photogramme, épreuve gélatino-argentique], 17x11,7 cm. (http://tinguely.cnac-gp.fr/NavImages/plein/3F/04/3F04115.JPG), 21 June 2005.

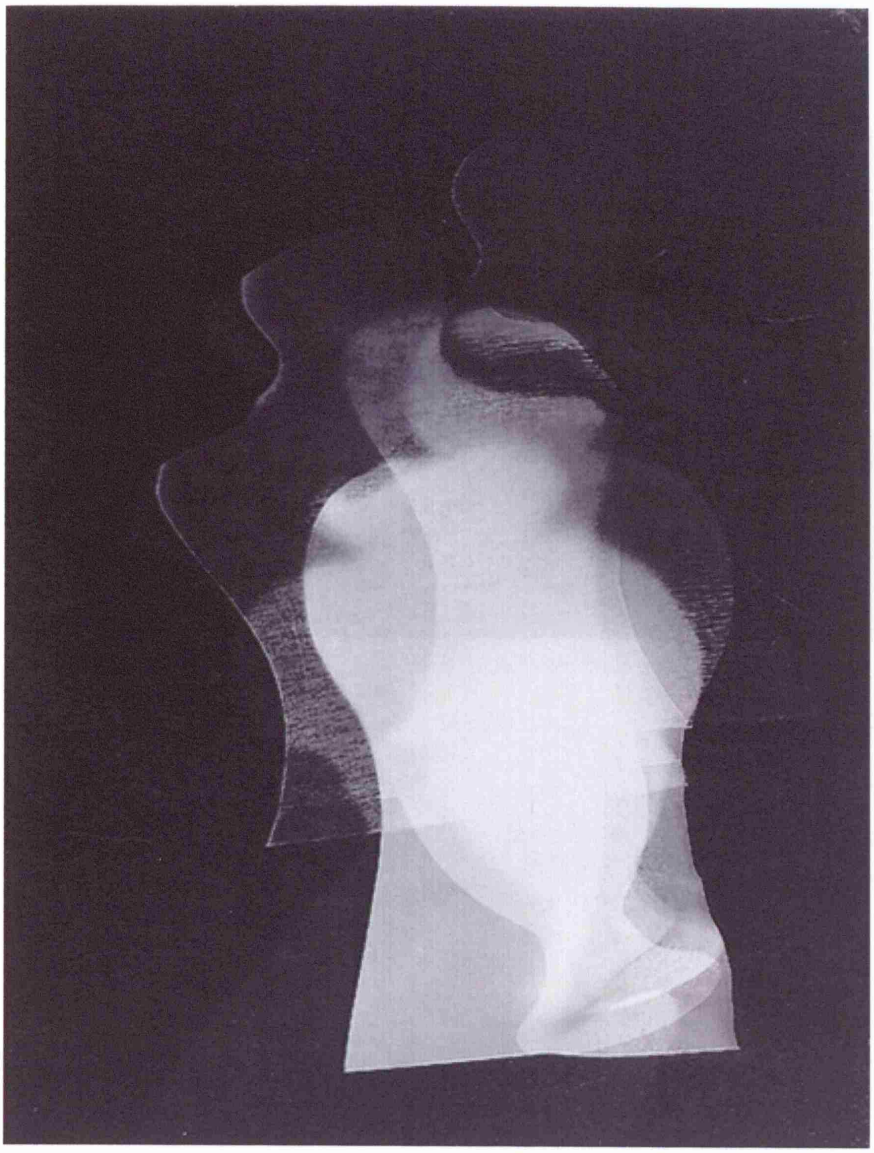

Fig. 4.10. Laszlo Moholy-Nagy, *Photogram without title, [Photogramme sans titre]*, (1925), [noir et blanc, photogramme, épreuve aux sels d'argent sur papier mat cartonné], 23,9x17,8 cm. (http://tinguely.cnac-gp.fr/NavImages/plein/3F/04/3F04123.JPG), 21 June 2005.

Moholy-Nagy observed that 'although some material effects do remain, as light translated through the photosensitive layer of the photogram into an almost immaterial substance, the way of the future to a more sublimated visual mode of expression may already be observed'.[40] According to Passuth, Moholy-Nagy's photograms 'are completely non-material, their only subject being light, atmosphere created around objects, and the structure which thus comes into being'.[41] Passuth compares with Man Ray's works in which there were 'only one or two objects' to Moholy-Nagy's photograms which included 'many elements' in which ' the individual item can assert itself only within a whole' [42]. According to Passuth, the elements 'seem to be floating under water or dissolving in the space around them' and for Moholy-Nagy, these effects 'became tangible, almost three-dimensional'.[43]

In a discussion of Moholy-Nagy's photograms art critic Sebastiano Barassi states that 'what is interesting, in terms of dematerialising effects, is the fact that the photogram, a negative image, reverses the conventional relationship between light and dark' and 'this makes solid bodies look light and weightless in a space that has become dark and very physical'.[44] Barassi argues that 'the photogram was therefore a prime example of the art Moholy-Nagy intended for a new language of light, space and time'.[45]

What fascinated Moholy-Nagy with the photogram was that it enabled 'us to grasp new possibilities of spatial relationships'.[46] In addition, Moholy-Nagy suggested that 'what appears in the photogram is no more than the effect of the various (measurable) exposures and of the distance of the source of light from the objects, which means that 'the photogram literally is the space-time continuum'.[47] In this new language of light, space and time, the immateriality of the line also became in Moholy-Nagy's work a process of dematerialization. As Moholy-Nagy describes, while the 'pigment has [...] been the major means of colour composition', and required a hand's brushstroke to be seen, in the photogram the brushstroke is replaced by the light 'fixing' on paper. [48] Rather than a bodily action, the artistic practice used to achieve a photogram places emphasis on the conceptual aspect – the consideration of how to capture the unpredictability of light.

As Moholy-Nagy states, 'in the photogram, finally it is the light that does the work', the apparent immateriality of a beam of light is able to create a mark and the photogram (or what Moholy-Nagy calls 'Photography without Camera') fixes the light in time. Moholy-Nagy

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[40] Passuth, *Moholy-Nagy*, pp. 305-6.
[41] Passuth, *Moholy-Nagy*, p. 35.
[42] Passuth, '*Moholy-Nagy*, p. 35.
[43] Passuth, '*Moholy-Nagy*, p. 35.
[44] Sebastiano Barassi, 'New Visions for a New World', *Brancusi Gabo Moholy-Nagy Immaterial:*, 17 January – 14 March 2004, (exhibition catalogue Cambridge, England: Kettle's Yard publications, 2004), p. 28.
[45] Barassi, 'New Visions', pp. 28-34.
[46] Otto Stelzer, Postcript, 'Moholy-Nagy and his Vision' refers to Moholy-Nagy's later work 'Vision in Motion' for these quotes see Laszlo Moholy-Nagy, *Painting, Photography, Film,* a Bauhaus book, (Cambridge Massachusetts: The MIT Press, 1987), pp. 148-9.
[47] Stelzer, Postcript, *Painting, Photography, Film*, pp. 148-9.
[48] Laszlo Moholy-Nagy, (transl.) Janet Seligman, 'Static and Kinetic Optical Composition', *Painting, Photography, Film*, a Bauhaus book, (Cambridge Massachusetts: The MIT Press, 1987), p. 20.

suggested that the 'fixing' of an immediate material like light in this new medium had great potential.

> *This potentiality can be practically utilized in the following manner: the light is allowed to fall on a screen (photographic plate light-sensitive paper) [to pass] through objects with different coefficients of refraction or to be deflected from its original path by various contrivances [...] the technique of the process consists in fixing different play of light and shadow.*[49]

Fixing of light and shadow happens through space and time if we consider that Grosz, quoting Bergson, defines space as 'discontinuous, infinitely divisible, static and always actual'[50] and sees time in terms of duration as 'a multiplicity of succession, heterogeneity, differences in kind and qualitative differentiations [...] continuous and virtual'.[51] According to Grosz, 'the virtual requires the actual to diverge, to differentiate itself, to proceed by way of division and disruption, forging modes of actualization that will transform this virtual into others unforeseen by or uncontained within it'.[52] In this sense, we can think of the photogram as a result of this actualization of the virtual – virtual light converted into the actual, unforeseen, material outcome. Moholy-Nagy's photograms, seen as a time-space continuum, are a form of actualization. The original objects placed on the photosensitive paper are dematerialised by the light and re-materialised or actualized by the photogram as lines on paper between light and shadow; the process transforming various light sources, or forms of time, into previously unforeseen images, or forms of space.

Grosz further elaborates on her notion of virtuality by discussing it in terms of futurity, suggesting that 'the virtual is the realm of productivity, of functioning otherwise than its plan or blueprint, functioning in excess of design and intention'.[53] For Grosz, 'this is the spark of the new that the virtual has over the possible: the capacity for generating innovation through an unpredicted leap, the capacity for the actual to be more than itself, to become other than the way it has always functioned'.[54] For Grosz this leap happens through what she calls '[the] logic of invention' and here a common ground between philosophy and architecture is established. The 'logic of invention' in Grosz's work is 'the linkage that invents new philosophies and new architectures' and it produces 'not premises so much as techniques, not conclusions so much as solutions, not arguments so much as effects'.[55] We could argue that Moholy-Nagy's view is very similar to that of Grosz when he states that: 'the creations are valuable only when they

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[49] Moholy-Nagy, 'Static and Kinetic', p. 32.
[50] Elizabeth Grosz quoting and interpreting Bergson, *Architecture from the Outside: Essays on Virtual and Real Space*, (Cambridge, Massachusetts; London England: The MIT Press, 2001), p. 113.
[51] Grosz, *Architecture from the Outside*, p. 113.
[52] Grosz, *Architecture from the Outside*, p. 130.
[53] Grosz, *Architecture from the Outside*, p. 130.
[54] Grosz, *Architecture from the Outside*, p. 130.
[55] Grosz, *Architecture from the Outside*, p. 111.

produce new, previously unknown relationships'.[56] In addition, he believed that to make an innovative leap required endeavour and when he discussed the camera he suggested that the role of the artist was 'to expand the apparatus (means) which has so far been used solely for purposes of reproduction' and he also stated that 'art attempts to establish far-reaching new relationships between the known and the as yet unknown optical, acoustical, and other functional phenomena'.[57]

For Grosz, following Bergson, 'space itself is produced through matter, extension, and movement'.[58] Grosz suggests that 'space is not a ground on which real motion is posited; rather it is real motion that deposits space beneath itself'.[59] In Grosz's words, the virtual is a kind of 'tendency' that 'can only actualize itself through its encounters with matter, with things, with movements and processes'.[60] The photogram, as conceived by Moholy-Nagy, is one such encounter – in which the tendency to capture light is actualized by positioning things on photo-sensitive paper and engaging with the time it takes to capture the light. These encounters with processes, time and matter in the case of a photogram result in an actualization of images that offers new spatial relationships.

For me, Moholy-Nagy's work on the photogram is a result of the actualization of the virtual – light – into an actual, yet unforeseen, material outcome – the line. Moholy-Nagy worked with the least material matter of all – light. I already observed that in the photogram it is no longer the hand that makes the line, but in Moholy-Nagy's words 'light does the work' [61] and as such the line is a form of virtuality. Even if light can be considered a form of matter and the photogram itself thought of as a material outcome I suggest that the line is a form of virtuality as it allows for the actualization of the virtual to take place – this occurs when light makes a mark on photosensitive paper. Moholy-Nagy's work on the photogram displays an immaterial way of working in the sense that the technique was concerned with the intellectual preparation of capturing the most immaterial matter – light.

Grosz's theoretical propositions can help us to understand more clearly Moholy-Nagy's ways of practising and theorizing. Moholy-Nagy underlined the importance of 'the simultaneous recording of interior and exterior processes, the uncovering of structures behind their surfaces'.[62] To consider this simultaneity of interior and exterior processes involves both space and time and 'also stands for a new way of perceiving material, energies, tensions and their corresponding social implications'.[63] In his work on photograms, Moholy-Nagy was, in his own

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[56] Laszlo Moholy-Nagy, 'Production Reproduction' (trans.) Janet Seligman, *Painting, Photography, Film*, a Bauhaus Book (Cambridge, Massachusetts: The MIT Press, 1987), p. 30.
[57] Moholy-Nagy, Painting, Photography, Film, p. 30.
[58] Grosz, *Architecture from the Outside*, p. 115.
[59] Grosz, *Architecture from the Outside*, p. 115.
[60] Grosz, *Architecture from the Outside*, p. 130.
[61] Rainer K. Wick quotes from Andreas Haus *MN : Fotos and Fotogramme*. See Wick, *Teaching at the Bauhaus*, p. 134.
[62] Laszlo Moholy-Nagy, *Vision in Motion*, (Chicago: Paul Theobald, 1947), p. 96.
[63] Moholy-Nagy, *Vision in Motion*, p. 96.

words, creating a process that could be utilized to discover new spatial relationships behind the surface of the image.

Moholy-Nagy described 'another way of moving towards productivity' in which the various different processes used to produce photograms could be altered by, for example, working with various chemical compositions that fix the light phenomena, or 'fixing' the electromagnetic vibrations onto a particular kind of screen. Leland Rice has suggested that Moholy-Nagy's working procedure, in particular 'The Mirror – Photogram No. 1' *(Fig. 4.5)*, aimed 'to discover through the process of the activity of making numerous photograms, moving elements around, pieces of paper'.[64]

I would like to suggest that with the photogram for Moholy-Nagy was a process of discovery, in which Moholy-Nagy expanded photographic practice beyond its limits in a twofold way – conceptually and in terms of technique and that he, through what Grosz calls the logic of invention, created new, previously unknown forms of production. Interested in the processes of 'fixing' light, Moholy-Nagy invented an immaterial form of practising by creating assemblages of objects on paper which predicted how light may fall on photosensitive paper. By dematerialising the object and rematerialising the light, the results made previously unknown relationships visible. Such a form of practice consisted of the enactment of conceptual thought – an immaterial, yet transformative force – in the material outcome – a photogram. The immateriality of conceptual thought can be considered actualized – transformed from the virtual into the actual. The immateriality of conceptual thought is the immaterial line of a photogram, which is a transformative line that, I argue, can be understood as, in Grosz's terms, actualizing virtuality. This line is an immaterial thought process, which allows a spatial outcome to happen. Capturing the most dematerialized medium, light, Moholy-Nagy, in his production of photograms, produced previously unseen spatial relationships.

Having examined the transformative, actualizing potential of the immaterial line in terms of virtuality, we turn to another property of the immaterial line in Moholy-Nagy's work – the anticipatory line. Whereas this section looked at the immateriality of the line of conceptual thought, in the next section I examine the anticipatory line of his photographs and how what he called his 'faulty' photographs provoke the viewer towards anticipation.

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[64] This was stated by Leland Rice during a panel discussion of a colloquium devoted to Moholy-Nagy's photographs that was held at the J. Paul Getty Museum in 1994. *Laszlo Moholy-Nagy: Photographs in the J. Paul Getty Museum*, (Malibu, California: The Museum, 1995).

## 4.2: AN ANTICIPATORY LINE

Like his photograms, Moholy-Nagy's camera photographs introduced quite distinct forms of visual practice *(Fig. 4.15)*, deploying unusual angles such as a bird's eye or frog's-eye views. Moholy-Nagy's photographs also entailed some form of spatially dislocating, mobile and often diagonal composition. Historian Rainer K. Wick, quoting Jeannet Simmen, suggests that Moholy-Nagy's photographs can be interpreted as 'the expression of a desire typical of the time to escape "beyond the order of gravitational forces" and "perspectival structure" of the certitude of the earth, suggesting 'floating as the definitive sign of modernism"'.[65] The purpose of Moholy-Nagy's experimentation with different angles, as Wick states following Simmen, was confirmed by Moholy-Nagy himself when he described the picture of a woman he had taken from above *(Fig. 4.16)*:

> *Formerly regarded as distortion, today a startling experience! An invitation to re-evaluate our way of seeing. This picture can be turned round. It always produces new vistas.*[66]

We could say that Moholy-Nagy attempted to rescue photography from a means of purely mechanical reproduction by actively transforming our sense of vision. He recognised the achievement of scientific experiments with photography that made visible to the eye things previously hidden, such as movement, microscopic photographs and x-rays. However, he believed that there was another challenge for the camera – to create a form of image that would reveal (in artistic terms) visual vistas beyond those from the obvious human eye level. Moholy-Nagy suggested that these photographs would involve 'the view from above, view from below, [and] the oblique view'.[67] For Moholy-Nagy, these photographs hold a 'secret of their effect' in which 'the photographic camera reproduces the purely optical image and therefore shows the optically true distortions, deformations, foreshortenings'.[68] Since these pictures have been taken from a view that is above or below the usual eye-level Moholy-Nagy suggested that 'we may say that we see the world with entirely different eyes'.[69] *(Fig. 4.15)*

Jeannine Fidler, an art historian and critic, quotes Franz Roh in suggesting that one of the important things in Moholy-Nagy's work is the way in which he achieved a different use of perspective in his photographs. Roh had argued that 'we are in the habit of interpreting sections of reality primarily in a horizontal line of vision', whereas Moholy-Nagy achieved with his photography 'a sudden change in level (lift, aircraft, etc.)'.[70] Roh regarded the change in level in these photographic experiments as capturing moments of expanded vision beyond the usual horizontal level.

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[65] Wick, *Teaching at the Bauhaus*, pp. 135-6.
[66] Moholy-Nagy, *Painting, Photography, Film*, p. 61.
[67] Moholy-Nagy, *Painting, Photography, Film*, pp. 28-9.
[68] Moholy-Nagy, *Painting, Photography, Film*, pp. 28-9.
[69] Moholy-Nagy, *Painting, Photography, Film*, pp. 28-9.
[70] Jeannine Fiedler, (trans.) Mark Cole, *Laszlo Moholy-Nagy 55*, (London; New York: Phaidon Press, 2001), p. 11.

Fig. 4.16. Laszlo Moholy-Nagy, *In the Sand*, rpt. in Laszlo Moholy-Nagy, *Painting, Photography, Film*, (a Bauhaus Book, Cambridge Massachusetts: The MIT Press, 1987), p. 61.

In order to understand the 'expanded vision' produced by these photographs I would like to focus on the particular way in which Moholy-Nagy's photographs were taken. Although the photograph was, in Moholy-Nagy's, words the 'beginning of objective vision', I would like to suggest that these photographs provoke in the viewer particular anticipation. Such anticipation depended on the position from which the photograph was taken and the relationship between the subject matter of the photograph and its relation to temporality.

The taking of a photograph is an instant click of the camera. However, the click is preceded by the intellectual negotiation of the photographer, which may be quick or slow. The positioning of the body of photographer, his or her distance from the subject, the framing and many other factors are involved in the preparation for the photograph. All of these processes are hidden and rarely leave any visible 'mark' in a photograph. Usually the most elusive thing in a photograph is the body of the photographer and his or her position in space in relation to the subject of the photograph.

However, I would like to argue that Moholy-Nagy's photographs taken from above and below are photographs that focus our attention as viewers on the photographer's position of the body in space and that this is a form of expanded vision that involves the engagement of the viewer. One particular photograph by Moholy-Nagy illustrates this form of expanded vision well. The photograph 'Untitled' (Ascona, 1926 or La Sarraz 1928) *(Fig. 4.17)* is taken from above looking down onto a street and stairs that are diagonally divided by the edge of a wall. Half of the photograph is in shade; half in sunlight. The shadow of the photographer and a cross (the photograph may have been taken close to, or even from, the rooftop of a church) are projected onto the sunny part of the photograph. The shadow of the photographer in the photograph demonstrates the position of his body in relation to the subject of his photograph. The photograph could be seen therefore as a kind of a self-portrait in which the photographer is present in the scene that he has been photographing.

Jeanine Fiedler suggests that 'Moholy fragmented the subject of his works, lending his compositions dynamism with extreme perspectives or diagonal views achieved by tipping the camera'.[71] Fiedler further states that 'Moholy's call for the re-evaluation of vision through photography elevates the perception of everyday reality into "super-reality" [...] the angled architectural compositions produce spatial perspectives that had never been seen before'.[72] Fiedler further suggests that 'this approach became central to the canon of "New Vision", and Moholy one of the definitive protagonists of this movement'.[73] In one of the famous examples of these photographs, 'Bauhaus Balconies in Dessau' (1926) *(Fig. 4.18)* Fiedler suggests that 'Moholy stages his dynamic concept of space, establishing a new, active relationship between man and architecture'.[74] However, it is interesting that Moholy-Nagy himself called his bottom and top view photographs 'faulty' stating that 'even the lens's possibility for distortion – so-called

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[71] Fiedler, *Laszlo Moholy-Nagy 55*, p. 11.
[72] Fiedler, *Laszlo Moholy-Nagy 55*, p. 30.
[73] Fiedler, *Laszlo Moholy-Nagy 55*, p. 11.
[74] Fiedler, *Laszlo Moholy-Nagy 55*, p. 34.

Fig. 4.17. Laszlo Moholy-Nagy, *Untitled* (Ascona, 1926 or La Sarraz, 1928), rpt. in Jeannine Fiedler, *Laszlo Moholy-Nagy*, (London: Phaidon, 2001), p. 50.

defective photographs (bottom view, top view, transverse view) must by no means be estimated only in a negative way; they actually provide unbiased visual effects which our eye, being bound by rules of association, is unable to achieve'.[75]

Moholy-Nagy was very critical of the traditional practice of photography and aimed to reveal a new vision through photography:

> *We have – through a hundred years of photography and two decades of film – been enormously enriched in this respect. We may say that we see the world with entirely different eyes. Nevertheless, the total result to date amounts to little more that visual encyclopaedic achievement. This is not enough. We wish to produce systematically, since it is important for life that we create new relationships.*[76]

Critical of photography used to 'supplement our optical instrument, the eye', Moholy-Nagy suggested that the artist should use photography in a different way and aim to produce a 'true' image.[77] For him the true image meant one where 'the photographic camera reproduces the purely optical image' and 'shows optically true distortions, deformations, foreshortenings, etc.'.[78] In comparison with the eye, the camera is free of interpretation on behalf of the photograph, and only captures what it can see, and for Moholy-Nagy 'the eye, together with our intellectual experience, supplements perceived optical phenomena by means of association and formally and spatially creates a conceptual image'.[79] For this reason according to Moholy-Nagy the photographic camera not the eye was capable of achieving the 'beginning of objective vision'.[80]

Yet, this search for objectivity is highly problematic in Moholy-Nagy's photographs. Firstly, he admits that the most inspiring photographs are in fact the 'faulty' ones, those that definitely demonstrate an element of chance and intuitive drive. Secondly, these 'faulty' photographs are deliberate in the photographer's choice of particular situations that arrest the temporal moment so to make the observer aware of possible futures or that deliberately transforms a usual view into an unusual view. While Moholy-Nagy spent much time trying to escape the subjectivity of associations that he claimed was the province of painting, he admitted to his wife Sybil towards the end of his life that:

> *I saw emotionalism [as] nothing but a carefully cultivated frontier between the individual and the group. Today I know better. Perhaps because I was a teacher for so long. I now see in emotionalism the great linking bond, rays of warmth which are reflected, answer and sustain us.*[81]

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[75] Passuth, *Moholy-Nagy*, p. 303.
[76] Moholy-Nagy, *Painting, Photography, Film*, p. 29.
[77] Moholy-Nagy, *Painting, Photography, Film*, p. 29.
[78] Moholy-Nagy, *Painting, Photography, Film*, p. 28.
[79] Moholy-Nagy, *Painting, Photography, Film*, p. 28.
[80] Moholy-Nagy, *Painting, Photography, Film*, p. 28.
[81] These are the words of Sybil Moholy-Nagy from her book *Moholy-Nagy Experiment in Totality* re-quoted in Otto Stelzer's Postcript 'Moholy-Nagy and his vision', *Painting, Photography, Film*, a Bauhaus book (Cambridge Massachusetts: The MIT Press, 1987), pp. 149-50.

Moholy-Nagy's 'faulty' photographs, taken from above and below, provoke and amplify a subjective expectation of the viewer. The viewer feels as if being physically drawn into the picture by extreme upward or downward views. Also, in the example of the view from above the viewer feels it captures a momentary scene that anticipates people who may have or will walk along the street, or decide to have a coffee at the currently empty tables. *(Fig. 4.19)* In another example of a scene captured on a Bauhaus balcony, there is a moment of suspension of time: a person hanging onto the railing of the balcony looks as if he is preparing to jump. *(Fig. 4.18)*

The temporality in these photographs needs a closer examination. Moholy-Nagy's photographs, because of the chosen position and their subject matter, create a certain anticipation in the mind of the viewer, an anticipation in terms of the suspension of time. In the example looking from above the Berlin Radio Tower *(Fig. 4.19)* the time seems frozen as the viewer, looking downwards from afar, may anticipate many events since the far-away ground is far-away is empty of any events. However, in the example of the Bauhaus balcony the viewer may anticipate the event that comes immediately after the taking of the photograph, and the viewer feels that time is compressed and momentary. For me, these photographs are examples in which the real, or what Grosz, relying on Deleuze, calls 'the actual', starts to 'diverge, to differentiate itself, to proceed by way of division and disruption'.[82] These photographs provoke thoughts concerning the future, the anticipation of space changing when people come to occupy a table, and whether a person on the balcony will proceed to jump or is just having fun. The future in these photographs is emphasised by a particular position from which the photograph was taken, and forthcoming events enter our imagination, as we are provoked to think ahead to what may happen in that space. This quality in these photographs is what I describe as 'anticipatory'. We do not know the exact event to which these photographs may allude. This possibility of the future can perhaps be best understood in Grosz's terms as 'forging modes of actualization that will transform this virtual into others uncontained within it'.[83]

In concluding my analysis of Moholy-Nagy's 'faulty' photographs, I see the line as anticipatory, and as such 'forging' possible futures. Through the way that they are taken – below and above the eye's usual level – they amplify our thoughts concerning what may happen next. This anticipation of the future possibilities follows immaterial lines that in Moholy-Nagy's photographs point to moments outside the image.

I turn now to another of Moholy-Nagy's innovative practices, that of photoplastics. This adds a new dimension to my discussion of the immateriality of the line, in terms of the ambiguous property of the line.

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[82] Elizabeth Grosz, 'The Future of Space', *Architecture from the Outside: Essays on Virtual and Real Space*, (Cambridge Massachusetts, London: The MIT Press, 2001), p. 130.
[83] Grosz, 'The Future of Space', p. 130.

## 4.3: THE AMBIGUOUS LINE

Moholy-Nagy's work on montages, or what he called *fotoplastiks,* (photoplastics or photo sculptures) displays another experiment in forms of immateriality. These works were the beginning of his development of many aspects of what he later called *typophoto*, the storyboard for a film. The technique, later developed with text and typography, was widely used for other purposes such as commercial advertising. However, Moholy-Nagy's early *fotoplastiks* display an emotional aspect of his life, and, in particular, these works use drawn lines.

Weston Naef, curator of photographs in J Paul Getty Museum, suggests that Moholy-Nagy's word for these types of work is an oxymoron, as 'in the visual arts the word plastic has traditionally been used to describe something infinitely malleable, by the hands or imagination of the artist'.[84] However, Naef emphasises that new photography has itself usually been thought of as the 'least plastic, least malleable medium'.[85] Moholy-Nagy's photoplastics do make malleable use of the photograph. As pointed out by art historian Jeannine Fiedler, what is important in Moholy-Nagy's *fotoplastiks* is his attempt 'to create a sense of depth' [86] and emphasise the three-dimensionality of the image. The drawn lines particularly suggest such three-dimensionality for Fiedler. However, Moholy-Nagy's use of drawn lines in his photoplastics produce, in my view, something beyond simply their three-dimensional volumetric aspect. A closer look at his photoplastics, and particularly his use of drawn lines, demands further exploration and analysis.

Another commentator on Moholy-Nagy's work, Passuth, suggests that 'thinly pencilled lines [...] give meaning to this work' and describes how 'Moholy-Nagy found his most characteristic genre in this so-called "photoplastic", in which photographic motifs are connected to each other by consciously constructed lines'.[87] Such lines, in her opinion, form a 'geometrical pattern' that produces a 'system outside the mosaic of reality'.[88] In my view, these drawn lines form immaterial connections with the world outside the image. Moholy-Nagy stated that 'the combination of photographic elements with lines and other components results in the production of unexpected tensions going far beyond the meaning of individual parts'.[89] In my view, the unexpected tensions created by the drawn lines themselves create immaterial relationships that lie beyond the representation.

Concerning his photoplastics, Moholy-Nagy said that their 'visual structure [...] is not [...] a solution of form and harmony for its own sake, but a composition formed in pursuit of the goal that has been seen: the formation of ideas'.[90] Such ideas seem to be evident in 'the combination of the photographically represented elements or events and the variety of layering

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[84] Naef, *Laszlo Moholy-Nagy In Focus*, p. 103.
[85] Naef, *Laszlo Moholy-Nagy In Focus*, p. 103.
[86] Naef, *Laszlo Moholy-Nagy In Focus*, p. 103.
[87] Passuth, *Moholy-Nagy*, p. 36.
[88] Passuth, *Moholy-Nagy*, p. 36.
[89] Laszlo Moholy-Nagy, 'Photography is Creation with Light' (in original 'Fotografie ist Lichtgestaltund' *Bauhaus*, II/1 (1928), reprinted and translated in Passuth, *Moholy-Nagy*, p. 304.
[90] Moholy-Nagy's words from 'Fotografie is Lichtgestaltung', p. 9, (note 25), quoted by Rainer K. Wick. See Wick, *Teaching at the Bauhaus*, p. 136.

ranging from simple to intricate, which take on a particular unity moving on an optically prescribed path as though on the rails of ideas'.[91] Furthermore, Moholy-Nagy states that 'this unity can act upon the viewer in an exhilarating, touching, appaling, satirical, visionary, revolutionary way'.[92] Fiedler has suggested that 'each of these photomontages was its own poem of sounds' [93] and Moholy-Nagy talked about them as 'the structure of a fugue or the arrangement of an orchestra, both of which, being constructed of more or less numerous layers, together create an unambiguous meaning'.[94] In photoplastics, in a similar way to sound, Moholy-Nagy suggested, 'visual and speculative factors are and must be conceivable at the very same moment if the effect is to be obtained'.[95] However, Moholy-Nagy outlines that 'the pictoral construction of photoplastics [...] does not aim at formal harmony, but is rather a composition directed towards the target: the representation of ideas'.[96]

The photoplastics were executed in a form of layering in which the montage was not the final product. Moholy-Nagy would first organize the photographs – blend images, paint over them, airbrush them – and finally he drew lines until they were complete. Then he made a final photograph of the photomontage itself. Naef suggests that for Moholy-Nagy the photographic copy seems to have been more important than the original montage itself.[97] In the technique another subtle difference between photomontage and photoplastics can be discerned:

Like photomontage, photoplastics are also mounted, applied and retouched elements of different photographs', but, 'in representing simultaneity photoplastics aim at moderation.[98] According to Moholy-Nagy, photoplastics 'are arranged clearly and utilize photographic elements to achieve a concentrated impact free of any disturbing side-effects'.[99] In addition, for Moholy-Nagy, photoplastics, 'actually portray concentrated situations which can be developed in an extremely short time through associations'.[100]

Using photoplastics to create associations perhaps suggests a narrative, a quality absent in many other works of Moholy-Nagy. The narrative content of photoplastics was often critical, metaphorical and personal. Fiedler has suggested that present in the photoplastics is 'the subtle permeability of the photogrammatic concept of light giving way to a, for Moholy, unusually graphic dialogue with the viewer'.[101] For Moholy-Nagy 'the effect of photoplastics derives from the penetration and blending of things that are inherent though not always visible in life, the visual perception of the simultaneity of events'.[102] Also, for Moholy-Nagy, 'photoplastics often express a speculatively hardly conceivable range of the most diverse

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[91] Moholy-Nagy, 'Photography is Creation with Light', p. 304.
[92] Moholy-Nagy, 'Photography is Creation with Light', p. 304.
[93] Fiedler, *Laszlo Moholy-Nagy 55*, p. 12.
[94] Moholy-Nagy's words that he wrote in Bauhaus magazine in 1928 and quoted by Jeannine Fiedler. See Fiedler, *Laszlo Moholy-Nagy 55*, p. 12.
[95] Moholy-Nagy, 'Photography is Creation with Light', p. 304.
[96] Moholy-Nagy, 'Photography is Creation with Light', pp. 304-5.
[97] Naef, *Laszlo Moholy-Nagy In Focus*, p. 104.
[98] Moholy-Nagy, 'Photography is Creation with Light', p. 304.
[99] Moholy-Nagy, 'Photography is Creation with Light', p. 304.
[100] Moholy-Nagy, 'Photography is Creation with Light', p. 304.
[101] Fiedler, *Laszlo Moholy-Nagy 55*, p. 13.
[102] Moholy-Nagy, 'Photography is Creation with Light', p. 304.

connections, the most bitter jokes, blasphemy; in them we may often see the evil side of human nature, or the revolt against mediocrity, in a clownish, witty, tragic and serious manner'.[103]

However, for me, the most central and yet the most enigmatic aspect of photoplastics is the drawn lines. Drawn lines in Moholy-Nagy's photoplastics create particular visual connections between the different cut-out photographs and so induce compression. In addition, the drawn lines appear designed to provoke particular associations in the viewer.

For example, in his *fotoplastik* 'Jealousy' (1925) *(Fig. 4.20)* Moholy-Nagy depicts an emotional scenario of a double. He is present in the picture three times, as a cut-out of the frame, as a negative photograph of himself next to the cut-out figure and as a shadow in another frame. The first, smaller frame is black and forms the background, the second, larger frame is outlined and forms the foreground. Within each frame there is also a figure of a different woman. The smaller, sitting figure holding a rifle is in the cut-out space left by Moholy-Nagy's carefully removed figure, carefully positioned at the place of his heart. The other, larger figure of a woman walking and smiling is positioned in the outlined frame in front of his shadow. The first woman aims at the second with a rifle. The line from the rifle materializes as an arrow stick aiming at the second woman's breast. The photoplastic consists then of two frames, two women and Moholy-Nagy present in each frame once (as a cut-out and as a shadow) and in between the two frames (as a negative photograph). What seems to make the connection and define the structure of the picture is the diagonal line, a line that follows the line of fire and also perhaps, as the title suggests, marks out jealousy. This diagonal line is not just a material line then; I argue that it can also be understood in relation to the title of the photoplastic, and so suggest the hidden narrative of the picture, one here of jealousy. Although drawn and materially present, this line dematerializes the picture, by suggesting, in association with the title, a narrative meaning that we do not know but may only guess at. The narrative presented by such line is highly ambiguous. We are not certain if the arrow-like line is simply jealousy towards another woman, even though she appears to be represented in Moholy-Nagy's heart. Also we are not certain that the line connects the two frames in which Moholy-Nagy appears either as a cut-out or a shadow while his representational photograph, although in negative, is in between the two frames. In this case the arrow-like line may be a line of the past events in Moholy-Nagy's life: by being between two women and jealousy he may possibly have destroyed both relationships, as suggested by Moholy-Nagy's presence in both frames as a cut-out or a shadow. It is in this way that I suggest that these ambiguous lines are immaterial.

In another *fotoplastik* 'Leda and the Swan', (1926) *(Fig. 4.21)* Moholy-Nagy worked to reverse a myth in which as Fielder describes, 'Leda, the object of Zeus's love, plays the active role as a high-diver, plunging into the centre of two intersecting bundles of spokes in which male figures are trapped', where 'Zeus, as the swan, is isolated, with the action taking place literally

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[103] Moholy-Nagy, 'Photography is Creation with Light', p. 304.

Fig. 4.20. Laszlo Moholy-Nagy, *Jealousy*, (1925), rpt. in Jeannine Fiedler, *Laszlo Moholy-Nagy*, (London: Phaidon, 2001), p. 29.

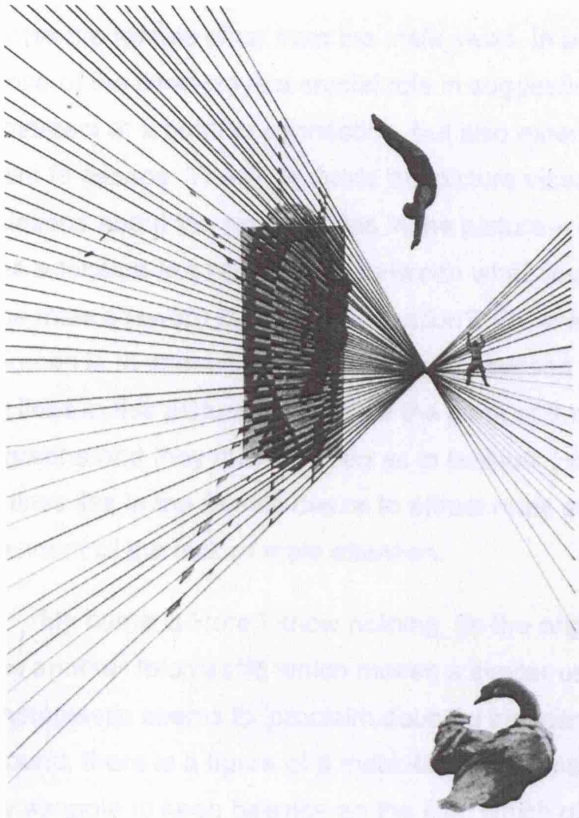

Fig. 4.21. Laszlo Moholy-Nagy, *Leda and the Swan*, (1926), rpt. in Jeannine Fiedler *Laszlo Moholy-Nagy*, (London: Phaidon, 2001), p. 32.

above his head'. [104] Fiedler suggests that this is a representation of male perplexity in the face of the increasing emancipation of women.[105] However, there also seems to be another meaning present in the image. The two men are trapped on each side of the picture, amongst lines that come from left and right to intersect at a point in the centre of the image, and the men look as if they are about to come out of the picture. The point of intersection is also what separates the female diver from the male swan. In a similar way to the previous example, the presence of the lines plays a crucial role in suggesting an absent narrative. The drawn lines not only intersect at a point of connection, but also extend to the edge of the photomontage as if they aim to escape. The lines divide the picture visually making the viewer create ambiguous associations about the relationships in the picture – such as, are we to understand that there may be a tension-like relationship between what could be seen as the female activity of diving and the male's (swan) inactive observation? Or, are we to understand that the performing jump of a woman is to seduce the inactive, self-obsessed male observer presented as the swan? The drawn lines in this picture intersect at the point of the relationship between two cut-out photographs and they may be seen as in tension. However, we are not certain if the tension of these lines lies in the female desire to attract male attention or lies in female activity independent of the lack of male attention.

'My name is Hare I know nothing' (in the original 'Meine name ist Hase') (1927) *(Fig. 4.22)* is another *fotoplastik*, which makes a similar use of lines. Again, in the words of Fiedler, this photoplastic seems to 'proclaim doubtful innocence or a naïve lack of concern'.[106] In the foreground, there is a figure of a mask-like hare, and in the background two female figures and a baby struggle to keep balance on the line, which diagonally crosses the picture. The lines might be circus-like or telegraphic communication lines but they fill the space of the image and may suggest a satirical point which focuses on how women struggle to balance their lives between children and work and connects this to the innocent and detached look of the rabbit that in the image is presented wearing a male cylinder hat and calmly crossed female hands – a pretence that he knows nothing of such a struggle. On the other hand, such image may be differently interpreted since the face of the rabbit and the hands have little resemblance to a male figure (except for the hat) and it may be that the struggle on the wires is more like a kind of circus-like gymnastic to be learned which may result in male-like award of some kind. Again, the drawn lines seem to present a considerable amount of ambiguity.

In all these photoplastics, the lines are also connected to a concept through a title that is equally open to interpretation, and this desired interpretation is emphasized by the ambiguous use of mythical or fairy-tale like figures. In a way, the images seem surreal in their content and mode of representation and, indeed, Passuth suggests that 'a strange insinuating effect is combined with much more unambiguous – sometimes even Surrealist – mode of expression'.[107] However, she also believes that 'nothing was farther from Moholy-Nagy's rationalism and ideal

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[104] Fiedler, *Laszlo Moholy-Nagy 55*, p. 32.
[105] Fiedler, *Laszlo Moholy-Nagy 55*, p. 32.
[106] Fiedler, *Laszlo Moholy-Nagy 55*, p. 44.
[107] Passuth, *Moholy-Nagy*, p.36.

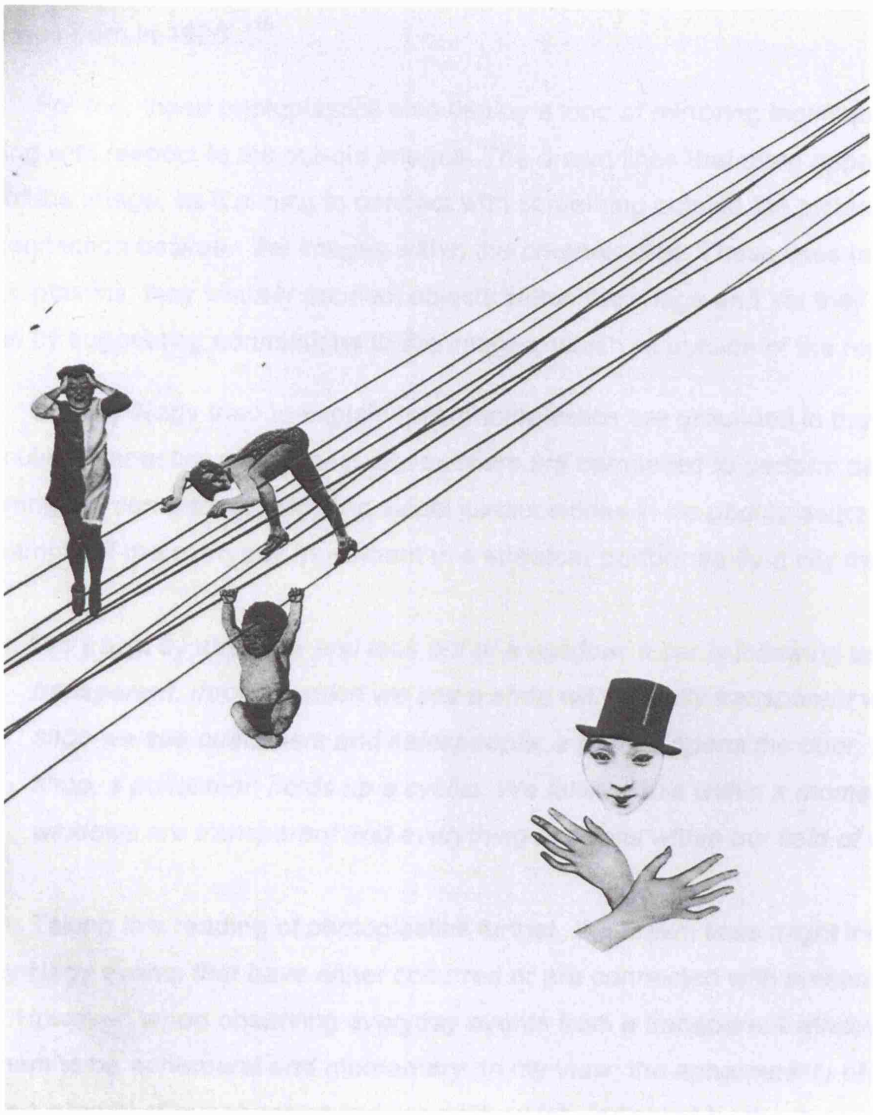

Fig. 4.22. Laszlo Moholy-Nagy, *My Name is Rabbit [Mein Name ist Hase]*, (1927), rpt. in Jeannine Fiedler, *Laszlo Moholy-Nagy*, (London: Phaidon, 2001), p. 45.

of artist-creator than free association' [108] and Moholy-Nagy talked of *fotoplastiks* being able 'to depict a seemingly organic super-reality', or 'super-photography'.[109] Yet, Passuth also suggests that 'strange, paradoxical relationships of allusions, half-pronounced or ambiguous sentences or words, together with pictures' demonstrates a 'mysteriousness' that 'could be discerned in Moholy-Nagy's art from 1923, too early to have been influenced by Surrealism, which was born in 1925'.[110]

For me, these photoplastics also deploy a kind of mirroring technique and effect a doubling with respect to the cut-out images. The drawn lines that often appear to go off the edge of the image, as if aiming to connect with something outside the picture, often provide the only connection between the images within the photoplastics. These lines have a dual role then in photoplastics; they visually connect objects within the image and yet they also dissolve the images by suggesting connections to the images, which lie outside of the representation.

Moholy-Nagy tried to explain that 'photoplastics are grounded in that kind of cerebral and ocular gymnastics which most city-dwellers are compelled to perform day by day'.[111] In explaining the complex content and visual juxtapositions in his photoplastics Moholy-Nagy takes the example of the everyday movement in a streetcar performed by a city dweller:

> *We travel by streetcar and look out of a window; a car is following us, its windows also transparent, through which we see a shop with equally transparent windows; in the shop we see customers and salespeople; a person opens the door, people pass by the shop, a policemen holds up a cyclist. We take all this within a moment, because the windows are transparent and everything happens within our field of vision.*[112]

Taking this reading of photoplastics further, the drawn lines might indicate then for Moholy-Nagy events that have either occurred or are connected with present reality or even the future. However, when observing everyday events from a transparent window of a streetcar we take them to be ephemeral and momentary. In my view, the ephemerality of these events and the short interval of our observations are deliberately indicated by the drawn lines in photoplastics, and it is through this structured message our imaginary associations are provoked.

Passuth suggests that there is a further process that 'takes place in photoplastics on another level, not as summary but as synthesis; speculative-associative and visual-sensory components result here in superimpositions and interpenetrations'.[113] Taking the example of 'New Museum: The Shooting Gallery' (1925-27) *(Fig. 4.23)* 'a black and white silhouette with a gun, several times repeated, faces a human-faced monster, lion, etc., its shadow extending

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[108] Passuth, *Moholy-Nagy*, p.36.
[109] Naef, *Laszlo Moholy-Nagy In Focus*, p. 105.
[110] Passuth, *Moholy-Nagy*, p.36.
[111] Moholy-Nagy, 'Photography is Creation with Light', p. 304.
[112] Moholy-Nagy, 'Photography is Creation with Light', p. 304.
[113] Moholy-Nagy, 'Photography is Creation with Light', p. 304.

weirdly over the ground' and the effect produced by 'the almost bare walls, disembodied figures and a strange aggressiveness' remind Passuth of Dali's and Bunuel's Surrealist films and in particular the film *Un Chien andalou* (1928).[114]

In Moholy-Nagy's photoplastics associations are made between the visible, material picture and invisible, immaterial narratives. This connection is material as it connects the image with something outside the frame, but it is also immaterial, as it indicates an absent meaning. In the examples analysed, this connection is amplified through the presence of drawn lines, which aim to expand the image beyond its representational content, and create a spatial relationship with the outside of the frame – its absent, narrative meaning indicated only by the title.

The titles of these photoplastics produce, for me, another immaterial line, again concerned with the idea and the thought processes it follows. As such the titles seem to further dissolve the representation of the image by encouraging in the viewer trajectories of thought. The title of the image underscores the meaning of the drawn lines. While the lines produce a structure in the image that may point towards an intellectual association, emphasised by the title of the image. Between the text and the image is an active relationship that I describe as an immaterial line, in this case an ambiguous line.

Having seen the forms of immateriality of the line in Moholy-Nagy's creative practice I would now like extend further this idea of immateriality of the line in terms of space. For me, Moholy-Nagy's work on the photogram and photography, in particular where 'the light does the work' also resonates with Picasso's experiments in his 'space drawings'. In 1949, Gjon Mili photographed Picasso while making his famous 'space drawings'. *(Fig. 4.24)* These were done in a dark room, with Picasso holding a light source as a pencil, drawing his visions in the dark. These 'space drawings' were created by 'intermittent flashes of light' and according to critic Anne Baldassari 'allowed the photographs to reveal not only the completed 'drawing' but, also, the artist's expression and his body at work'.[115] Mili stresses how 'these lines of light are snapshots of Picasso's', which fully reveal 'the automatic reflex between hands and brain' and that 'this process, because divorced from concrete reality, presupposes a kind of voluntary blindness'.[116] Picasso, however, suggests that he is seeing 'with eyes of St Lucy' (who was blind), which means he is feeling and touching space through his hands and skin:

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[114] Passuth, *Moholy-Nagy*, p. 36.
[115] Anne Baldassari, 'Beyond Appearances 1950-1960', *Picasso and Photography: The Dark Mirror*, Deke Dusinberre (trans.), (Paris: Flammarion; Houston: Museum of Fine Arts, 1997), p. 219.
[116] This voluntary blindness Picasso wanted to call seeing 'with the eyes of Saint Lucy' as he wrote in a poetic fragment explicitly referring to photography. See Anne Baldassari, 'Beyond Appearances 1950-1960', *Picasso and Photography, The Dark Mirror*, (trans.) Deke Dusinberre, (Paris: Flammarion; Houston: Museum of Fine Arts, 1997), p. 256.

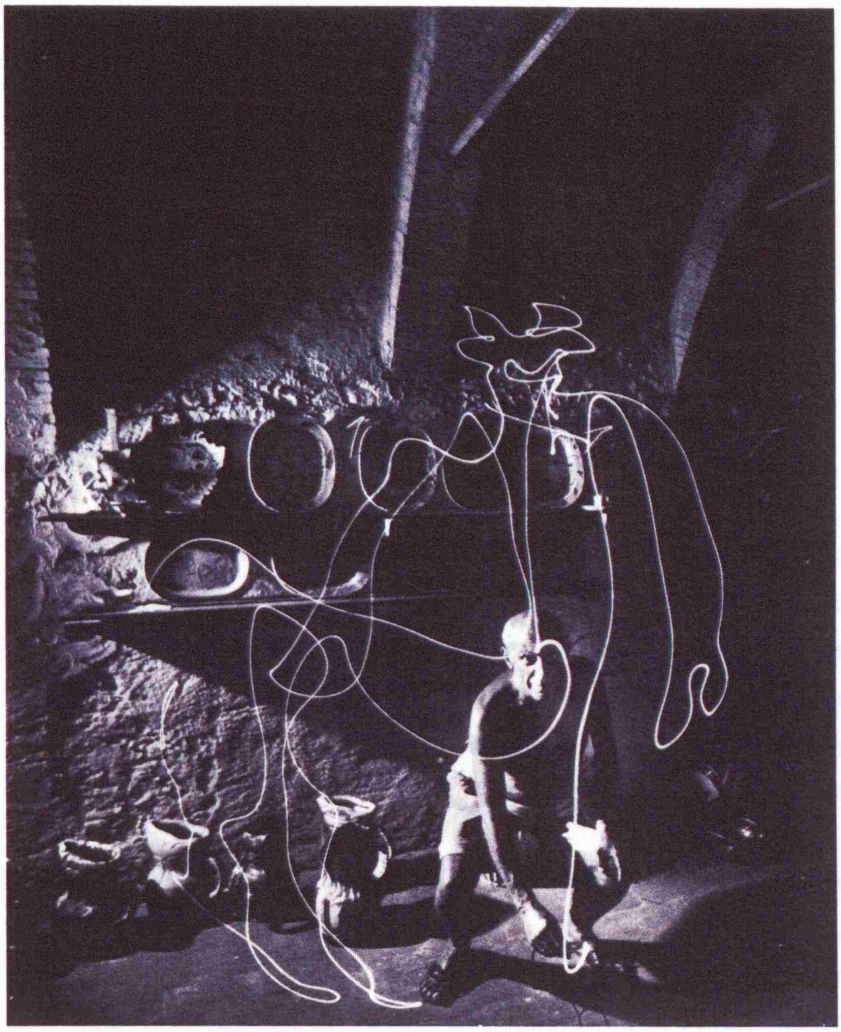

Fig. 4.24. Gjon Mili, Picasso *'Drawing' with flashlight, Vallauris,* (1949), rpt. in Rosalind E. Krauss, *The Optical Unconscious*, (Cambridge, Massachusetts: The MIT Press, 1996), p. 299.

*When the bull with his horn*
*- opens the door of horse's belly*
*- and places his muzzle on board*
*- listening to the deepest of all*
*in the deep of the hold*
*- with the eyes of Saint Lucy...*
*and sees...and sets the*
*photographer's eye - above*
*the banqueting table - and pulls*
*the thread out little by little*
*- and makes the ball -*
*that portraits his fine figure*
*-on a plate of silver*
*- which drips-clearly-plummeted-with sun.*[117]

In this work Picasso was trying to depict vision beyond the visible, immaterial vision present in the body of the artist. Drawing in the air with light and capturing it in photography, suggests the inseparability of the relation between vision and touch. Picasso drew in space with light as if touching a picture plane. The 'blind' body of the artist acquires vision in the dark. This body-eye performs the line with a flash-light in the dark but the line can only be 'seen', as a line as opposed to a flashlight by the naked eye, by the technological tool – a camera.

These lines of light recorded in Mili's photographs are in my view lines taken for a walk. The lines trace of the movement of the body of the artist, through the medium of technology and construct vision and space in such a way that the line is taken from the painting or drawing and into a space outside the picture frame.

In Picasso's 'Space drawings' lines are made without any material touch – except light and the body of the artist. This is a line taken outside the confines of the frame and spatialized through technological means. In the process of taking a line for a walk, the material properties of lines are expanded.

The emphasis on dissolving materiality and emphasizing relationships in space starts to redefine material as concept, idea, body, energy and force. These lines create space through conceptualisation, the process of thinking and the deployment of technology. For Deleuze, Grosz suggests, 'thought starts in the middle, at the point of intersection of two series, events, or processes, which however temporarily, share a common milieu'.[118] What Grosz outlines in

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[117] Text written in French, (15 November, 1935) *Picasso 4*, pp. 43-4 quoted in notes. See Baldassari, 'Beyond Appearances 1950 -1960', p. 256.
[118] Grosz, *Architecture from the Outside*, p. 69.

relation to Deleuze, and what seems to be evident in Moholy-Nagy's experiments that attempted to 'escape' from the material, is that the creation of spatial relationships in Moholy-Nagy's work can be seen as a breaking up of objects into elements and a placing of emphasis on the immaterial lines of a thought process.

The relationships that Moholy-Nagy has created in painting, photography, photograms and later in film, generates forms that can be best described as spatial dialogues. This spatial dialogue is something that allows for 'becoming' to take place between spatial components. In relation to architecture, which is a spatial practice, Grosz's question is relevant: 'can architecture be thought, no longer as a whole, a complex unity, but as a set of and site of becomings of all kinds?' [119]

Thinking about architecture through such a question asks us to consider what constitutes the practice of architecture. The practice of architecture understood as 'a set and site of becomings of all kinds' may include ways of practising architecture through different techniques – material and immaterial – that involve ideas and lines of thought. Grosz states:

> *Thought is what comes between a cause and its habitual effect, between one being and another, a fissure between strata that allows something from them to escape, to ramify. It is an unhinging – perhaps a deranging – of expectation, order, organization, to replace them not with disorder or disorganization but with reordering.*[120]

Our habitual way of thinking about architecture can be opened up to reveal a different mode of spatial thinking to create architecture through immaterial means. Such immaterial means are present in Moholy-Nagy's discoveries of photograms, photographs and photoplastics, and his exploration of different properties of the line. The immaterial lines are displayed in the virtuality within the photogram, the anticipation lines invited by the photographs and the associative lines of the photoplastics. However for Moholy-Nagy, the immateriality of the line relied on a new technological tool, the camera. In Picasso's experiments the immateriality of the line is exploited differently, since it is no longer on paper, opening up new possibilities of how the line can be spatialized further once it has left the picture plane. This spatialization of the line and the associated strategies of thinking lead us to the topic of the next chapter, which is concerned with the projection of the line.

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[119] Grosz, *Architecture from the Outside*, p. 71.
[120] Grosz, *Architecture from the Outside*, p. 70.

## 5.0: THE PROJECTION OF THE LINE

We have seen how imaginative activity in the mind may be seen as an immaterial line of influence that impinges on the formation of spatial relationships. I have argued that this immateriality is allied to Elizabeth Grosz's ideas of 'virtuality', which she sees as lying 'outside' architecture and that the province of, this 'virtuality' she defines as 'thought' and 'life'.[1] I have argued that the line's immateriality can be understood in terms of the production of lines that take into account conceptual activity rather than bodily action. I also argued that the immaterial line is a line of thought in terms of the artist's conceptual preparation for the execution of the material outcome.

I also argued that the immaterial line present in Moholy-Nagy's photographs from above and below of the eye's usual focus suggest an intuitive subjectivity provoking anticipatory connections in the mind of the observer. I also argued that the lines in Moholy-Nagy's photoplastics that visually connect the cut-out photographs are also ambiguous lines in these images since they are speculative-associative and visual-sensory lines of things lying outside the image.

In this chapter I would like to look at the ideas of the immateriality of the line from a different perspective. First I would like to suggest that once we take a line outside its traditional background – paper or canvas – and project it onto a background, a variety of concerns come into play. The first concern to address is the role of the background surface and its relationship to the line. The second concern is to explore how a projected line differs from a drawn one and what this may mean for the boundaries between art and architecture.

In order to understand the role of the background in thinking about lines, Mark Wigley's argument concerning the 'liminal' role of paper as the background for a line will be discussed as well as his assumptions concerning drawing lying at the disciplinary boundaries established between art and architecture. Taking Wigley's position on paper as a liminal background for the line and Robin Evans's understanding of projection as a 'zone of instability' with a pivotal role in the design process, the line's background and the line's projection will be further examined in the light of Moholy-Nagy's creative experiments on the role of the projection screen and his innovative stage organization for theatre productions. Moholy-Nagy's experimental ideas paved the way for a different understanding of a projection screen and thus a new understanding of the line in such a context. This will be analysed and discussed in **Section 5.1: The Background of the Line**.

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[1] Elizabeth Grosz, *Architecture from the Outside: Essays on Virtual and Real space* (London, England; Cambridge Massachusetts: The MIT Press, 2001), p. 70.

Moholy-Nagy's experiments aimed to innovate using new forms of projection and new forms of spatial relationship that resulted from the breaking-up of the background screen into multifaceted sets of screens and simultaneous projections. I argue that in using such processes he also sought to find a mode of drawing that best represented the resulting change in our conceptions of space. His 'Score Sketch of a Mechanical Eccentric' (1924-5) is a unique drawing that aims to demonstrate the multiplicity of actions that occur when a theatre performance evolves over time. The 'Score Sketch' drawing is an image that Andrew Benjamin would call a drawing with 'a capacity to reduce an image to the position of zero', that is, a drawing devoid of representational and illustrative qualities but rather a generative drawing in which 'there is a possibility of realizing that which is yet to come'.[2] For Benjamin, drawings that possess such qualities are diagrams. The role of the line in such drawings will be analysed in relation to Moholy-Nagy's experimental 'Score Sketch' drawing as a template for his 'Theatre of Totality' where the line is seen as a 'force'. This will be discussed in **Section 5.2: The Line in a Diagram**.

Once we consider how the background of line has changed, and that the drawing has left the paper and became spatialized, the focus will be on the role of the line in the ultimate practice of projection – film. Moholy-Nagy's experiments with kinetic sculpture and in particular the 'Light-Space Modulator for an Electric Stage' (1928-30), and the film in which this sculpture in motion plays a pivotal role, 'Light Display: Black-White-Grey' (1930) allow a further exploration of our understanding of movement and time in relation to the line. This exploration considers Gilles Deleuze's discussion of the relationship between matter and image as well as movement and time. This exploration starts to re-define the role of the line in creative practice as a 'line of flight' that effects and dismantles conventional ways of thinking, making and acting. Moholy-Nagy's work on kinetic ideas in his material sculpture and his projection ideas in his film start to challenge traditional thinking about the role of drawing as well as how the line is to be understood in such new practices. This will be analysed and discussed in **Section 5.3: The Line in a Film**.

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[2] Andrew Benjamin 'On Diagram', a lecture from the course *From Splines to Lines* delivered at the Architectural Association School of Architecture, (London: AA Lecture Archive, 2 February 2005, DVD, 67min, 6/8).

## 5.1: THE BACKGROUND OF THE LINE

> *The surface becomes a part of the atmosphere, of the atmospheric background; it sucks up light phenomena produced outside itself – a vivid contrast to the classical conception of the picture, the illusion of an open window.*[3]

> *[...] The interpretation of Malevich's last picture – the plain white surface [...], [...] constituted an ideal plane for kinetic light and shadow effects which, originating in the surroundings, would fall upon it. In this way, Malevich's picture represented a miniature cinema screen.*[4]

In his work on various theatre productions, in particular 'Tales of Hoffmann' (1928) and work on film, in particular 'Light Display: Black-White-Grey' (1930) Moholy-Nagy experimented with various aspects of projection and the background on to which projections were displayed. His critique of a plain white surface as the background for a projection originated from a comparison of the background for projection with the traditional painting surface. For Moholy-Nagy, understanding the background of projection as a traditional painting surface was limiting and his suggestion instead was that the background surface could be understood differently. Moholy-Nagy's different conception of the background surface included possibilities for its transformations with various light displays and different stage organisations. Moholy-Nagy stated that:

> *The rectangular canvas of metal screen of our cinemas is really a mechanized easel painting, our conception of space and of the relations of space and light, still absurdly primitive, being restricted to the everyday phenomenon of light rays entering a room through an aperture in one of its walls.*[5]

His proposal for the enrichment of our spatial experience was to consider projection onto 'a succession of semitransparent planes (nets, trellis-work etc.)' that he applied in his scenic experiments for the *Kaufmann von Berlin* stage production performed in Berlin in 1930.[6] Another idea was to 'replace a single screen by concave or convex sections of differing size and shape that would form innumerable patterns by continual change in position'.[7] Moholy-Nagy also suggested that we should consider the projection of 'different films onto all the walls of the

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[3] Laszlo Moholy-Nagy, *The New Vision and Abstract of an Artist*, [1928] (New York: Wittenborn, the fourth revised edition, 1947), p. 39.
[4] Moholy-Nagy, *The New Vision*, p. 39.
[5] Laszlo Moholy-Nagy, "Projection" in 'Problems of the Modern Film', Richard Kostelanetz (ed.) F. D. Klingender and P. Morton Shand (trans.), *Moholy-Nagy: an Anthology*, [written 1928-30 and originally published in *Cahiers d'Art*, VII/6-7 (Paris, 1932)], (New York: A da Capo Press, 1970), pp. 131-8,137.
[6] Moholy-Nagy, 'Projection', p. 137.
[7] Moholy-Nagy, 'Projection', p. 137.

cinema simultaneously' or to project onto 'gaseous formations such as smoke clouds', or (finally) 'by the interplay of multiform luminous cones'.[8]

In his early book *Painting, Photography, Film* Moholy-Nagy had already attempted to 'break-up' the background screen by using multiple projections and introducing different shapes of projection screen. He suggested that 'one can, for example, visualise the normal projection plane being divided by a simple adapter into different obliquely positioned planes and cambers, like a landscape of mountains and valleys'.[9] Another of his ideas for changing the projection screens was to change their shape into 'a segment of a sphere instead of the present rectangular one'.[10] For Moholy-Nagy, such a 'projection screen should have a very large radius and therefore very little depth and should be placed at an angle of sight about 45 degrees for the viewer'.[11] Another possibility suggested by Moholy-Nagy was that 'more than one film [...] would be played on this projection screen; and they would not [...] be projected on to a fixed spot but would range continually from left to right or from right to left, up and down, down and up, etc'.[12] *(Fig. 5.1)* What Moholy-Nagy was seeking was an enriched spatial experience, whereby the presentation of 'two or more events which start independently of one another but will later by calculation combine and present parallel and coinciding episodes'.[13] For Moholy-Nagy, such projection screens had the advantage over traditional ones in that they 'represent[ed] a process of movement [...] with greater illusion' rather 'than the present projection screen on which one image must always be fixed'.[14]

Such explorations into the background for projection allowed Moholy-Nagy to explore different conceptions of space. One of Moholy-Nagy's dreams was to produce a different kind of architecture, which he called 'light architecture', and in which 'light-apparatus [...] would produce visions of light in the air, in large rooms, on screens of unusual nature, on fog, vapour and clouds'.[15] 'Light architecture', for Moholy-Nagy was a transformation of 'two dimensional' and 'painted surfaces' into three-dimensional architecture that was '"painted" direct with light'.[16] His various projects, which were never executed, he called 'light-fresco, light architecture' and 'light symphonies' and were propositions consisting of 'straight or arched walls, covered with material such as galalite, trolite, chromium or nickel, which by turning on a switch, could be flooded with radiant light'.[17] For example, Moholy-Nagy envisaged that 'light-fresco' would be something the future would bring, where 'coloured light becomes an architectural unit of

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[8] Kostelanetz (ed.), *Moholy-Nagy: an Anthology*, p. 137.
[9] Laszlo Moholy-Nagy, 'Simultaneous or poly-cinema', *Painting, Photography, Film*, [original published in 1925 in *Bauhausbucher 8* as *Malerai, Fotografie, Film*], (Cambridge, Massachussets: The MIT Press, second printing 1987), pp. 41-3, 41.
[10] Moholy-Nagy, *Painting, Photography, Film*, p. 41.
[11] Moholy-Nagy, *Painting, Photography, Film*, p. 41.
[12] Moholy-Nagy, *Painting, Photography, Film*, p. 41.
[13] Moholy-Nagy, *Painting, Photography, Film*, p. 41.
[14] Moholy-Nagy, *Painting, Photography, Film*, p. 41.
[15] Laszlo Moholy-Nagy, 'Light Architecture', in Richard Kostelanetz (ed.) *Moholy-Nagy: An anthology*, [originally published in *Industrial Arts*, I/1, [Spring 1936], (New York: A da Capo Press, 1970), pp. 155-9, 155.
[16] Kostelanetz (ed.), *Moholy-Nagy: an Anthology*, p. 155.
[17] Kostelanetz (ed.), *Moholy-Nagy: an Anthology*, p. 155.

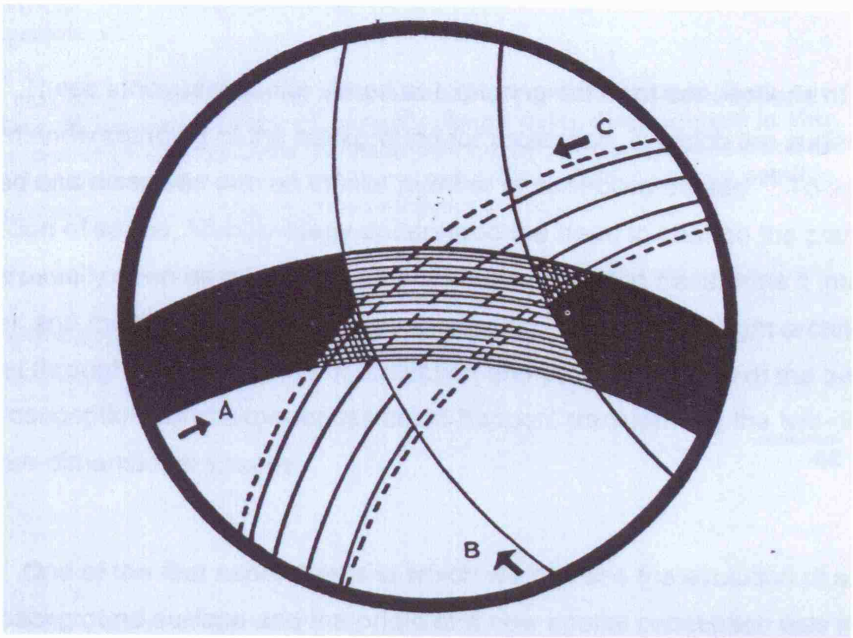


Fig. 5.1. Laszlo Moholy-Nagy, *Schematic drawing for simultaneous or poly-cinema*, rpt. in *Painting Photography Film*, (Cambridge, Massachusetts: The MIT Press, 1987), p. 42.

buildings, interior or exterior' and in houses of the future 'some place will be reserved for these light frescoes'.[18] Another interesting idea of his was 'Color Piano', which consisted of an instrument 'fitted with a keyboard and, by striking the keys, lamps are lit up or flickering shadows are projected'.[19] In addition he suggested that adverts might be 'projected onto gaseous volume which people might even walk through'.[20]

These innovative ideas aimed at exploring different conceptions of space through a different understanding of the background for projection, in which the surfaces would be 'slowly changed and dissolved into an infinite number of controlled details'.[21] To achieve a different conception of space, Moholy-Nagy understood the need to change the plane of the background surface usually seen as a 'mechanized easel painting' and transforms it into a dissolved, complex and multifaceted background. Proposing concepts like 'light architecture', Moholy-Nagy saw that through different forms of projection and the breaking-up of the background plane new spatial conceptions and experiences could happen, transforming the two-dimensional surfaces into three-dimensional spaces.

One of the first experiments in which we can see the evolution of a different treatment of the background surface and the origin of a new spatial conception was in Moholy-Nagy's initial experimental drawings of the 'Score Sketch of a Mechanical Eccentric' (*Partiturskizze zu einer mechanischen exzentrik*) (1924-5) *(Fig. 5.2)*. This consisted of drawing notations showing how a theatre performance and stage organisation could evolve over time. According to Moholy-Nagy, the drawing was a 'synthesis of form, motion, sound, light (colour) and smell'.[22] The drawing consists of two differently drawn parts. At the top of a drawing there is an axonometric diagram that proposes a stage in three parts. *(Fig. 5.3)* The rest of the drawing consists of four columns that represent diagrammatic notations of the four critical aspects of theatre performance: the timing and mechanics of moving stage elements and effects (form and motion), the actions on the stage (form, motion and cinema), light (colour) and sound (music).[23] These abstract diagrammatic notations offer a rich variety of interpretations, to which we shall return later, but for the moment we shall focus on the first part of the drawing showing the stage and how it already fractures and transforms the background surface into three different spatial propositions.

The axonometric drawing of the three-part stage *(Fig. 5.3)* shows the first stage as 'the bottom part' envisaged 'for larger objects and movements'.[24] The second stage (the one above)

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[18] Kostelanetz (ed.), *Moholy-Nagy: an Anthology*, p. 158.
[19] Kostelanetz (ed.), *Moholy-Nagy: an Anthology*, p. 158.
[20] Kostelanetz (ed.), *Moholy-Nagy: an Anthology*, p. 159.
[21] Kostelanetz (ed.), *Moholy-Nagy: an Anthology*, p. 155.
[22] Laszlo Moholy-Nagy, 'Score Sketch of a Mechanical Eccentric' [*Partiturskizze zu einer Mechanischen Exzentrik*] first published in Bauhaus book no 4 *The Stage in Bauhaus* [*Die Buhne im Bauhaus*], Kathrin Hassold (trans.), (Munchen: Albert Langen Verlag, 1924), no page no.
[23] Moholy-Nagy, 'Score Sketch", no page no.
[24] Moholy-Nagy, 'Score Sketch", no page no.

consisted of 'fold-out glass panels for smaller objects and movements' [25]. Finally, the third stage, or, what Moholy-Nagy called the 'in-between stage' was for 'mechanical music instruments' which are 'mostly without a resonant body, only with megaphones (drum, percussion, and wind instruments'.[26] In addition, Moholy-Nagy explained that the 'separate walls of the stage' with 'double-sides white canvas', 'let past and divert the coloured lights from the spotlights'.[27] This drawing of a stage fractured the classical conception into different elements that consisted of fold-out screens and double-sided canvases. In his drawing of the stage, Moholy-Nagy envisaged a theatre production that attempted to break-up the unified notion of the background surface.

Although Moholy-Nagy's interest in stage design existed before coming to the Bauhaus[28], these ideas became evident during the Bauhaus years, and particularly in his contribution with Oskar Schlemmer to the Bauhaus book 'The Stage in Bauhaus' (in original 'Die Buhne in Bauhaus')[29]. Krisztina Passuth suggests that, unlike Schlemmer who saw the theatre as 'man's projected, enhanced and multiplied presence', Moholy-Nagy saw 'the stage [...] as a structure' which could be made to be 'functional'. Passuth suggests that 'he was interested in it as a possible variant of the dynamic-constructive system of forces'.[30]

Moholy-Nagy's drawings of the stage for his first commission for a theatre stage design, 'Tales of Hoffmann', demonstrate how elements of the stage could be positioned. *(Figs 5.4, 5.5, 5.6)* Drawn in a way that demonstrates the relationships between various elements, these drawings also show the focus areas of the stage in relation to the particular act in time. In *(Fig. 5.4)* the elements of the stage show Act II – Giuliette's Palace in Venice. In *(Fig. 5.5)* the elements represent Act I – Spalauzanis Kabinett. The drawings are diagrams and notations of the elements further transformed by actions on the stage and by lighting conditions. In the drawing there is an obvious absence of background surfaces, and the focus is on the elements of the stage. In the photographs of the stage and even in the photographs of the models for the stage a sense of transformation takes place through the use of light and lighting projections. *(Figs 5.7, 5.8, 5.9)* In *(Fig. 5.7)* the projection of light above the stage screen is of a circular nature, intersecting with distinct black shadow lines, which spatially expand the stage and dissolve the appearance of the background surface. In *(Fig. 5.8)* light projection captures the fragile outlines of constructed screens producing a spatial drawing of different layers of the background surface and transforming the background into a multilayered space. In *(Fig. 5.9)* there is an ultimate light and shadow projection effect achieved with projections. The scene

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[25] Moholy-Nagy, 'Score Sketch", no page no.
[26] Moholy-Nagy, 'Score Sketch", no page no.
[27] Moholy-Nagy, 'Score Sketch", no page no.
[28] According to Krisztina Passuth, Moholy-Nagy's first theatrical assignment was from Erwin Piscator's Political (formerly People's) Theatre where he made stage designs for Upton Sinclair's play 'Prince Hagen' when he arrived in Berlin in 1920. See Krisztina Passuth, *Moholy-Nagy*, (London: Thames and Hudson, 1985), p. 56.
[29] Laszlo Moholy-Nagy, 'Theatre, Circus, Vaudeville show' [*Theater, Zirkus, Variete*] and 'Score Sketch of a Mechanical Eccentric' [*Partiturskizze zu einer mechanischen exzentrik*] were first published in Bauhaus book no 4 *The Stage in Bauhaus* [*Die Buhne im Bauhaus*], Kathrin Hassold (trans.), (Munchen: Albert Langen Verlag, 1924), no page nos.
[30] Passuth, *Moholy-Nagy*, p. 56.

looks almost like an abstract photograph, or even a pictogram, suggesting different spatial relationships. Here, the stage is dissolved in the play of light and shadow, and architectural boundaries are broken up by the dissolution of the background surface.

Passuth suggests that while the production of 'Tales of Hoffmann' only required Moholy-Nagy 'to contribute to the revival of an opera', by designing 'the functional mobile structure and stainless steel scaffolding [...] traversed by beams of light' evidenced in the photographs Moholy-Nagy makes 'us think of a film rather than theatrical scenery'.[31]

Moholy-Nagy's stage design suggests a number of ways in which stage design and projection can transform spatial relationships. Firstly, we have already seen that Moholy-Nagy saw the surface (usually understood as a background of a painting) as a background for painting by light. This he already had experimented with in his photograms, but in the projection of light onto a background surface, he tried to go even further in transforming spatial experience. Secondly, he saw the opportunity to dissolve the background surface by fracturing it and using different modes of projection. Finally, he suggested that once the background is split, changed or simultaneously projected onto, a transition occurs from two-dimensional surfaces to three-dimensional space, which he called 'light architecture'. Free of the boundaries usually produced by the walls, 'light architecture' was created through motion and light, offering a different spatial organization through a continuously changing series of relationships between movement and light. Here, Moholy-Nagy was experimenting with the space that exists between the drawing and its background surface, in which the role of the background surface acquires a different and rather more significant role.

Trying to separate the line from its background by using projections, Moholy-Nagy's experiments started to re-define the concept of the background surface, on which a line, no longer drawn, but formed by light and shadow, could be projected. If a drawing is not regarded as a drawn series of marks on a surface like paper or canvas, then a significant question emerges: what happens to the drawing when the background gets re-defined? Also, what does it mean to 'spatialize' a drawing (take a drawing from a paper background onto another kind of background) in the manner that Moholy-Nagy's experiments suggested?

Wigley, in discussing Constant's drawings for New Babylon (1960), questions the role of the paper as the background for a drawing. He suggests that paper is usually never noticed in a gallery display, but that what is noticed are the marks made on the paper. Wigley suggests that the paper is usually treated as if it were not quite there, 'as if it occupies a liminal space between material and immaterial' which in turn 'allows it to act as a bridge across the classical

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[31] Passuth, *Moholy-Nagy*, p. 56.

divide between material and idea'.[32] Furthermore, he argues that there is 'a certain way of looking at paper, or rather a certain blindness to it, allows physical marks to assume the status of immaterial ideas'.[33]

According to Wigley's argument, the paper is invisible as a background when a drawing is exhibited in a gallery space. Moreover, what is drawn acquires an immateriality. However, if we consider that the background for a drawing could be something else, like the gallery wall itself, or any other surface, then there also needs to be a change in the way in which we start to think about the status of a drawing and the drawn line.

What Wigley additionally highlights is that Constant's drawings were drawn after the making of the physical models of New Babylon, and that their role was to 'give the stunning models the status of architecture rather than sculpture'.[34] For Wigley this meant that the role of a drawing was to outline the disciplinary boundary of the proposals, in this case architecture. However, Wigley states that the 'role of drawing is enigmatic' [35] in Constant's project, as, unlike in traditional architectural practice, there are no working drawings. In Constant's project the drawing was not a transitional stage in the production process nor did it simply come at the very end as a presentation.

The suggestion that the drawing is 'enigmatic' because it lies outside the traditional architectural process of design, where drawing is usually situated between the idea and the realization of a project, starts to question not only the status of a drawing but also the boundary of the discipline of architecture. Wigley states that the variety of techniques used by Constant, like collaging and cutting by scissors, are not traditional architectural techniques, like ink and pen. Techniques that Constant used by which the drawing is produced by scissors for example had an effect on a drawing in which 'drawing had assumed a very different role and character'.[36] Wigley argues that Constant's drawings that followed his models of New Babylon should be seen as 'a mechanism of disciplinary displacement or confusion'.[37] These drawings, according to Wigley 'steadily lure architects from the familiar to the unfamiliar'.[38] For Wigley 'drawing techniques typically used in architecture, those that seem to most properly belong to the architectural world (detailed plans, sections, and elevations) steadily give way in the project to those that are foreign in both technique and their almost complete blurring, distortion, or erasure of the architectural forms'.[39] In Wigley's opinion, in art there seems to be an opposite situation in

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[32] Mark Wigley, 'Paper, Scissors, Blur', *The Activist Drawing: Retracing Situationist Architectures from Constant's New Babylon to beyond*, Catherine de Zegher and Mark Wigley (eds), (New York: The Drawing Center; Cambridge, Massachusetts; London: The MIT Press, 2001), pp. 27-56, 29.
[33] Wigley, 'Paper, Scissors, Blur', p. 29.
[34] Wigley, 'Paper, Scissors, Blur', p. 31.
[35] Wigley, 'Paper, Scissors, Blur', p. 32.
[36] Wigley, 'Paper, Scissors, Blur', p. 33.
[37] Wigley, 'Paper, Scissors, Blur', p. 37.
[38] Wigley, 'Paper, Scissors, Blur', p. 37.
[39] Wigley, 'Paper, Scissors, Blur', p. 37.

which 'unfamiliar subjects and techniques give way to the familiar' [40]. In this sense, Wigley concludes that Constant's New Babylon takes an artistic approach and 'is a calculated assault on disciplinary limits, and drawing is a key part of the arsenal'.[41]

Mark Wigley observed that paper is conventionally invisible in a drawing, and that the drawing, both in when it was done, and in how it was executed, may be seen as a key tool for the distortion of the disciplinary limits between art and architecture. Here, two particular points need to be addressed. Firstly, what happens to disciplinary limits if the technique of drawing does not deal with material itself – brush, ink or scissors – but with the projection of a line onto a background surface? Secondly, what happens if the background for such drawing is no longer paper?

In order to focus further on these possibilities we need to address Robin Evans' understanding of the role of projection in relation to geometry and space. For Evans, the relationship between geometry and architecture becomes active in the in-between space – the space where connections between thinking, imagination, drawing, and building happen through various what he calls 'guises of projection' or 'processes that we have chosen to model on projection' which Evans calls 'zones of instability'.[42] For Evans the most interesting questions regarding the relationship between architecture and geometry occur in these zones.

These definitions of projection in relation to drawing make Evans see design as 'action at a distance' where the gaps between actions and distance are filled in with different kinds of projection. For Evans, the art of architecture lies in the arrangement of emanations from drawings to buildings, and from buildings to the experience of the perceiving and moving subject. These 'emanations' create unstable voids that cannot be easily portrayed in design.[43] According to Evans only through projection are we able to find ways of interconnecting palpable experience and abstract mathematics; and geometry for Evans is the 'doorway' between the real and the mental.

In the concluding part of his book Evans draws a diagram, which, in his opinion, best describes the role of projection in design. *(Fig. 1.3)* For Evans, 'projection operates in the intervals between things' and 'is always transitive'.[44] Evans' diagram demonstrates various 'guises' of projection that can occur between drawings (orthographic images), designed objects (buildings), and the observer. Evans' diagram is not only an explanation of these relationships, but also an attempt to see projection as both a tool for design and as a space imagined by the observer. The diagram also assumes a particular understanding of the discipline of architecture,

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[40] Wigley, 'Paper, Scissors, Blur', p. 37.
[41] Wigley, 'Paper, Scissors, Blur', p. 37.
[42] Robin Evans, *The Projective Cast: Architecture and its Three Geometries*, (Cambridge, Massachusetts; London, England: The MIT Press, 1995), p. xxxi.
[43] Evans, *The Projective Cast*, p. 363.
[44] Evans, *The Projective Cast*, p. 366.

one that operates in the space between geometry, drawings and buildings all related through the observer's mind, imagination and ideas. Evans suggests that the space behind the dotted line of the diagram has a purpose 'to show how projection – or rather quasi-projection – breaches the boundary between the world and self, the objective and subjective'.[45] Behind the dotted line, which represents the observer, there are two discs showing perception and imagination, both 'belonging to the observer' and the 'two projective spaces behind him'.[46] Evans concludes that 'imagination and visual perception are shown as pictures' even though 'they are not pictures' but 'the very fact that both are thought of in that way is very significant'.[47]

Evans's diagram clearly aims to describe and understand the complexity of relationships that occur during the design process and what happens in the spaces between the observer, reality (spaces and objects) and pictures (drawings) situating the role of design as 'action at a distance'. However, what the diagram alludes to but does not elaborate in much detail is the perceptual and imaginary field of the observer. The diagram also demonstrates a closed circuit of relationships between the observer, designed object, perspective and orthographic drawing in which the orthogonal lines of connection between them suggests that the projection is both a tool and an idea through which design can be achieved. What is of particular interest here is whether there is another additional role that projection might fulfil and that which is missing from this diagram. This also begs the question of how design is to be understood if there is another form of projection. And finally whether a different kind of drawing may evolve from a different understanding of projection.

If we return to Wigley's argument that drawing is the place where disciplinary boundaries are negotiated, Moholy-Nagy's experimental work in theatre and film and its relationship to projection and the background, seem to offer a different kind of understanding of drawing and projection. Through the use of different techniques deploying light the projection starts to assume a role, which differs from the one that it is usually understood to have within the architectural technique of drawing and as defined by Evans. Projection, in relation to Moholy-Nagy's experiments, provides a technique by which a moving, non-static drawing can be achieved on any background surface. This in turn allows the drawing to be a three-dimensional space that may be immediately experienced. The drawing, taken from paper into space, can be immediately experienced, and, in a way, inhabited. Although using what might be called an artistic technique to achieve drawing in space, Moholy-Nagy created an immediate experience of architectural space where design is no longer seen as 'an action at a distance' but as an action in the moment or action now. Wigley's point is that by using unfamiliar techniques for architecture, like cutting – the technique that Constant used in his drawings for New Babylon – and that by using such techniques more common in the art world and alien to architecture, Constant's project made an assault on the disciplinary boundary of architecture. In

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[45] Evans, *The Projective Cast*, p. 369.
[46] Evans, *The Projective Cast*, pp. 369-70.
[47] Evans, *The Projective Cast*, p. 370.

my opinion Moholy-Nagy's technique of projection and his construction of different kinds of background surfaces is his attempt to extend his artistic practice spatially and into an architectural domain. For me, similar to Constant's drawing techniques Moholy-Nagy's work on projection and the background surface is one such technique that disturbs the usually understood boundary of art and extends it into architecture.

Evans sees projection located in the mind of the observer/creator and connected to representations and experience through the observer's perceptive and imaginatory faculties. Moholy-Nagy's experiments with projection and background surface materialize an image (that in Evans's case resides in the observer's mind) by projecting it in space, making it visible and at the same time fully experienced by the observer/creator. In this sense the relationship between the observer, designed object, and drawing suggested by Evans' diagram has changed. New, looser relationships seem to be forged in which the tripartite structure of the diagram presented with three orthogonal lines stemming from the observer/creator could be imagined differently and in which the lines representing the connections are more relaxed. Rather than being represented as if being in a rigid tension these lines in the Evans' diagram, stemming from the observer, could be imagined as lines of rope fallen on the ground.

If a drawing's production and its background can disturb the disciplinary limits between art and architecture, the examples of the art work of Moholy-Nagy, who 'drew' with light and 'fractured' the background surface, offer a spatial experience. Such drawing is already spatial and offers an immediacy of experience in which the role of the background surface plays an important part. Such a drawing could be seen as architecture. Once the background paper is replaced with a projection screen or a series of screens or different forms, drawings can happen anywhere in space, transforming our understanding of the solidity of the edifice of architecture and its primary tool, the line. Here the line is projected in space and we can imagine that the observer/creator in Evans's diagram may be able to move along the relaxed, rope-like lines of the diagram while actively perceiving, imagining and experiencing the spatial relationships created by moving pictures and lines. However, such an understanding of a 'drawn' line opens a question which is pertinent to Moholy-Nagy's work on theatre and film projections: what kind of drawing is possible once we have understood the role of projection and background surface in this way?

## 5.2: THE LINE IN A DIAGRAM

> *Diagram [...] 'The capacity to reduce (an image, for example) to the position of zero, or to see it as a diagram; to rid it of its iconic, symbolic investment and allow it another existence. In the diagram there is a possibility of realizing that which is yet to come.*[48]
>
> *Plural event – event of ontological plurality, the material-immaterial in architecture is a precondition for the diagram to be operative.*[49]

In a drawing for 'Score Sketch of a Mechanical Eccentric' (*Partiturskizze zu einer machanischen exzentrik*) *(Fig. 5.2)* Moholy-Nagy proposed in a diagram how a theatre performance might evolve. The four columns in this diagrammatic drawing try to demonstrate various aspects of theatre performance:

> *The 1st and 2nd column of the score means action of form and motion in vertical descending continuity. The 3rd column shows successively the following light effects: The width of the stripes signifies duration. Black=darkness. The small vertical stripes that occur in the large stripes are partly illuminating the stage at the same time. The 4th column is set for music; here only indicated in tendencies. The coloured vertical stripes signify different siren tunes, which accompany a major part of the action.*[50]

In drawing these 'columns' Moholy-Nagy imagined how aspects of performance evolve over time. The first column Moholy-Nagy called 'form and motion'. This consisted of various actions on the stage, such as: 'arrows descend – fins open up', 'circles are rotating – electric apparatus – thunder and lighting', 'bar systems of colours – shoot back and forth – phosphorescence', giant apparatus swing - light-up', 'bars continue – wheels – explosions – smells', 'clownery – human mechanic'.[51] *(Fig. 5.10)*

The second column Moholy-Nagy called 'form motion and cinema'. He suggested that the notated actions in this column evolved in parallel to the first one but in slower time with much fewer actions: 'arrows descend – fins open-up – circles are rotating', 'cinema on a dayscreen turned backwards – action – speed – wild'.[52] *(Fig. 5.11)*

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[48] Andrew Benjamin 'On Diagram', a lecture from the course *From Splines to Lines* delivered at the Architectural Association School of Architecture, (London: AA Lecture Archive, 2 February 2005, DVD, 67min, 6/8).
[49] Benjamin, 'On Diagram'.
[50] Moholy-Nagy, 'Score Sketch', no page no.
[51] Moholy-Nagy, 'Score Sketch', no page no.
[52] Moholy-Nagy, 'Score Sketch', no page no.

The third column Moholy-Nagy called 'light (colour)'. This demonstrated notated actions that ran in parallel with the first two columns and was brightly coloured, demonstrating the type, duration and change of lighting conditions during the performance. *(Fig. 5.12)*

The fourth and end column Moholy-Nagy called 'sound (music)'. Here the notated actions ran in parallel with the other three columns. However, this sound column seems to be particularly related to the column demonstrating lighting effects in which the lighting effect would change in relation to a particular sound. The column also shows how by using different musical scores differences in sound could be achieved throughout the performance. *(Fig. 5.13)*

The notations of actions in each of the columns are related to one of Moholy-Nagy's three stages: the main stage, the stage for projection and the in-between stage. *(Fig. 5.3)* Column one actions are to be performed in stage one (the main stage), column two actions are to be performed in stage two (the stage with fold-out projection screen) and the column four are actions to be performed in stage three – the in-between stage where mechanical musical instruments are situated. The lighting effects in column three affect all spaces and stages.

However, what is of particular interest in these column-notations is the way that they have been drawn and positioned in relation to each other. Moholy-Nagy has separated a variety of actions within each column. These actions take place simultaneously in space on three different stages. As Moholy-Nagy suggested 'the synchronisation in the score appears in the horizontal'.[53] The relationship between columns happens in the gaps between them, horizontally.

Apart from its similarity with the idea of a musical score, the 'Score Sketch' drawing opens up other interesting issues. As stated by Moholy-Nagy, the synchronising relationship between the columns is horizontal, although there are no drawn lines in the 'Score Sketch' that make this connection. These absent, un-drawn, lines are what Moholy-Nagy refers to when he states that synchronisation happens horizontally. These absent lines are temporal lines that connect the various actions represented in each of the columns in a unified performance. The absence of explicit, or drawn connections between the separate parts (columns) is also what makes the drawing appear like a musical notation. In a musical score the temporal gaps are part of the notation, but here we have to imagine similar temporal gaps between the actions depicted in each column that are the part of the performance. As a drawing 'Score Sketch' seem to offer an un-prescribed way of how the performance may evolve, in other words, it demonstrates the potentiality of the performance. In this sense, we can view the 'Score Sketch' as a propositional as well as a generative drawing, suggesting a plurality of actions and events. Unlike the example of an illustrative drawing for stage organization, there are a number of

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[53] Moholy-Nagy, 'Score Sketch', no page no.

performances that potentially could all stem from such a non-illustrative drawing. The 'Score Sketch' is a drawing that consists of column-notations and whose parallel vertical positioning allows for many possibilities to be made across them horizontally. The drawing could be seen as proposing something 'yet to come'.[54] One thing 'yet to come' is the potential of the future performance. Such potential is open to interpretation, since the 'Score Sketch' is a non-illustrative, rather abstract drawing; its notations are without 'symbolic' or 'iconic' investment. As Andrew Benjamin suggests when discussing diagrams, such drawings 'allows for another existence' and 'the possibility of realizing that which is yet to come'.[55]

Benjamin suggests that the 'diagram operates both prior to icons and prior to symbols' and 'in a sense presupposes the possibility of their eventuality'.[56] Benjamin further elaborates, in relation to Deleuze that as such, a diagram, exists 'prior to representation'.[57] Benjamin further outlines how the diagram articulates the idea of the future, as 'in the diagram there is a possibility of realizing that which is yet to come'.[58] However, he states that in order to allow for such a future 'the notion of final form vanishes'.[59] In other words, for something that is yet to come',[60] the future, there should be no completeness or finitude.

For Benjamin, such incompleteness in a diagram may be achieved through abstraction. He further suggests that 'the notion of abstraction has to be thought in relation to potentiality' in which the diagram should be used 'not to think volume, but to think spatial relations and programmatic considerations'.[61]

For Moholy-Nagy, spatial and temporal relations are crucial in understanding architecture. He states that 'space does not have to do with a "sculptural" exterior, but instead with relations [...] since, in architecture not sculptural patterns, but spatial relations are the building elements'.[62] The task for architecture is not to be understood as being 'completed with a single structure' but as space creation in all directions, space creation in a continuum'.[63] In such space 'boundaries become fluid' and 'space is conceived as flowing – a countless succession of relationships'.[64]

Discussing the theatre, Moholy-Nagy further elaborates his ideas about actions and relationships: 'To present or articulate reality or a possibility of reality [...] only the tensions, hidden in the mediums that are limited to the most essential put it into an all-round, dynamic

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[54] Benjamin, quoting Deleuze, 'On Diagram'.
[55] Benjamin 'On Diagram'.
[56] Benjamin, 'On Diagram'.
[57] Benjamin, 'On Diagram'.
[58] Benjamin, 'On Diagram'.
[59] Benjamin, 'On Diagram'.
[60] Benjamin, 'On Diagram'.
[61] Benjamin, 'On Diagram'.
[62] Moholy-Nagy, *The New Vision*, p. 63.
[63] Moholy-Nagy, *The New Vision*, p. 63.
[64] Moholy-Nagy, *The New Vision*, p. 63.

action relation: this is stage design'.[65] Referring to the Futurists, Expressionists and Dadaists who emphasized the phonetic relations of words and produced incoherent vocals and consonants in the 'Theatre of Surprises',[66] Moholy-Nagy suggests that 'the human being, who until then was in the theatre solely the medium of logical-causal actions and vital thinking, was used dominantly in the 'Theatre of Surprise'.[67] In Moholy-Nagy's opinion, a further development of the 'Theatre of Surprises' would replace the human being with what he called a 'mechanical eccentric', which would become 'an action concentration of the stage'.[68] In such a space 'the human, who shouldn't be allowed to present himself as a thinking phenomenon in his thinking skills (logical-theoretical) anymore, would lose his space in this action concentration'.[69] The inadequacy of a human eccentric as part of this new stage organisation of actions 'led to the demand of a totally controllable, exact form and motion organisation, which should have been the synthesis of dynamical, contrasting appearances (of space, form, motion, sound and light). Mechanical eccentric'.[70]

The 'Mechanical Eccentric' was Moholy-Nagy's proposition for a new theatre, which he called the 'Theatre of Totality'. In the words of Moholy-Nagy, 'in the plan of such a theatre, the normal – reasonable causal relations CANNOT play the main part', but rather 'the Theatre of Totality has to be artistic design, with its various relations of light, space, area, form, motion, sound, human – with all possible combinations of these elements, it has to be an ORGANISM'.[71]

Thinking about space, architecture and theatre as a series of relationships, Moholy-Nagy, as an artist, aimed to find a new way of conveying his ideas concerning the simultaneity of actions and different spatial relationships. This simultaneity for Moholy-Nagy meant a plurality of events (light, space, form, motion and sound) that created both the immaterial and the material of architecture.

If we are to imagine that the immaterial lines in the 'Score Sketch' are lines of horizontal connections then the possibility, or the potentiality opened up by such lines allows this drawing to be seen as an operative diagram. The drawn, abstract lines of each column are material marks beyond representation, abstract, notational, non-illustrative and ambiguous devoid of any 'iconic' or 'symbolic' qualities. These lines, as Benjamin suggests, 'resist the notion of predictability'.[72]

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[65] Laszlo Moholy-Nagy 'Theatre, Circus, Vaudeville show' [*Theater, Zirkus, Variete*], *The Stage in Bauhaus* [*Die Buhne im Bauhaus*], Neue Bauhausbucher, Kathrin Hassold (trans.), (Mainz und Berlin: Bei Florian Kupferberg), pp. 44-56, 46.
[66] the T'heatre of Surprise' was a Dadaistic and Futurist theatre where 'the relation of words can be transmitted in solely sound relations' and where a 'total dissolution of the word' into 'incoherent vocals and consonants'. Its aim was literally 'to totally erase the logical thought'. Moholy-Nagy, 'Theatre', p. 46.
[67] Moholy-Nagy, "Theatre', p. 47.
[68] Moholy-Nagy, 'Theatre', p. 47.
[69] Moholy-Nagy, 'Theatre', p. 47.
[70] Moholy-Nagy, 'Theatre', p. 47.
[71] Moholy-Nagy, 'Theatre', p. 51.
[72] Benjamin, 'On Diagram'.

In Moholy-Nagy's 'Score Sketch' *(Fig. 5.2)* the lines and techniques through which this drawing was executed seem to illustrate what Benjamin means when he talks about 'discontinuity at the level of an image' and how the drawing itself 'resist[s] the notion of predictability'.[73] 'Score Sketch' can be thought of as discontinuous at the level of an image in terms of the four parallel columns – drawing notations – which allude to temporal and spatial relationships, while resisting predictability or the completeness of any formal proposition. This way of drawing opens up various formal possibilities.

Moholy-Nagy also did not envisage the 'Theatre of Totality' (1924-5) as a place of formal completeness. He suggested that 'items became mechanically movable on stage' and that 'nothing is in the way of using complex APPARATUSES, like film, car, elevator, plane and other machines, as well as optic instruments, mirror mechanisms and so on'.[74] Moholy-Nagy saw an opportunity to re-design the stage to support such apparatus. He suggested that 'besides a rotating device, the stage will have panels and special constructions that are removable from back to front and from top to bottom, for emphasizing dominantly pieces of the action (moments of action) on stage in detail, like the close-up shot in film'.[75] There would be 'a track connected with the stage' which 'could displace the today's ground floor loge, to create a connection with the audience (like a forceps clutch)'.[76] For Moholy-Nagy, these spatial propositions suggested that 'the space would no longer exist of area connections in an old fashioned way, which only knew the architectural imagination of space as closed, linked connection of areas'.[77] Rather 'the new space comes into existence through loose areas or linear area limits (wire frame, antennas) so that the areas are possibly only in a loose relationship to each other, they don't need to touch each other'.[78] In this new organisation even the auditorium and costumes would change to ones 'subordinated to the moment of action and it is possible with them to let sudden changes happen'.[79] What this meant for Moholy-Nagy is that 'an increased control of all design medium develops, gathered into one unit of their effect, constructed to an organism of total balance'.[80]

To draw such complexity involves separating the function and form into actions and relationships between elements. This was what Moholy-Nagy did in his 'Score Sketch' drawing. In thinking about theatre performances as an 'organism in balance' he tried to predict the variety of forces operating within such an organism. The only way to draw such relationships was through ambiguity and abstraction where lines and colours in the drawing activated certain areas of intensity or calmness and where the absence of drawn horizontal connections between column notations allowed for a variety of potential possibilities.

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[73] Benjamin, 'On Diagram'.
[74] Moholy-Nagy, 'Theatre', p. 54.
[75] Moholy-Nagy, 'Theatre', p. 55.
[76] Moholy-Nagy, 'Theatre', p. 55.
[77] Moholy-Nagy, 'Theatre', p. 55.
[78] Moholy-Nagy, 'Theatre', p. 55.
[79] Moholy-Nagy, 'Theatre', p. 56.
[80] Moholy-Nagy, 'Theatre', p. 56.

Ideas about actions and relationships for Moholy-Nagy originated from his art practice. As early as 1922, when discussing art, Moholy-Nagy proposed that 'we must [...] replace the static principle of classical art with the dynamic principle of universal life'.[81] This proposition suggested that instead of static material construction (material and form relations), dynamic construction (vital construction and force relations) must be evolved in which the material is employed only as the carrier of forces'.[82] We have seen that his 'Score Sketch' diagrammatic drawing replaced the static with dynamic relationships, and, in addition demonstrated that the material line in the diagram is a carrier of force .In the case of 'Score Sketch' it is the force that indicates theatre actions. The drawn lines in the 'Score Sketch' anticipate future constructions and stage effects and suggest a multiplicity of actions that could happen on a stage.

In his description of events on the different stages in the 'Score Sketch', Moholy-Nagy uses words like 'arrows descend – fins open up', 'circles are rotating – electric apparatus – thunder and lighting', 'bar systems of colours – shoot back and forth – phosphorescence', giant apparatus swing – light-up', 'bars continue – wheels – explosions – smells', 'clownery – human mechanic', 'cinema on a day screen turned backwards – action – speed – wild'.[83] These words do not depict the events themselves but the actions and forces made by mechanical elements on the stage, as well as other performative actions that occur on the stage. The events become the result of these various relationships, actions and interactions.

Moholy-Nagy's experiments with 'Score Sketch' and his ideas for a 'Theatre of Totality' demonstrate a desire to influence the production of an event. This production of an event is close to what Cliff Stagoll suggests in relation to Deleuze's understanding of an event as 'the product of the synthesis of forces, events [that] signify the internal dynamic of their interactions'.[84] The lines that make the 'Score Sketch' a diagram not only allude to both the immaterial and material, but also suggest actions, interactions and the production of events. As such, these material and immaterial lines could be seen as active and productive forces. Seeing lines as active and productive forces constitutes a significant departure from representative and illustrative modes of drawing, towards generative and productive forms. In such diagrams lines are forces through which this productivity becomes possible. Such forces should be seen as vectors that allow for a 'productive intensity' and a futurity 'yet to come'. In this respect Moholy-Nagy's work on the 'Theatre of Totality', for which 'Score Sketch' may be regarded as its diagram, is an example of the generative force of the line.

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[81] Laszlo Moholy-Nagy, 'Dynamic-Constructive System of Forces' [*Dynamisch-konstruktives Kraftsystem*] *Der Sturm*, Berlin, (1922), no.12, rpt. in Krisztina Passuth, *Moholy-Nagy*, (London: Thames and Hudson, 1985), p. 290.
[82] Moholy-Nagy, 'Dynamic-Constructive', p. 290.
[83] Moholy-Nagy, 'Score Sketch', no page no.
[84] Cliff Stagoll, 'Event', *The Deleuze Dictionary*, Adrian Parr (ed.), (Edinburgh: Edinburgh University Press, 2005), p. 87.

## 5.3: THE LINE IN A FILM

*[...] Cinematic image projected on the screen is perceived not as a set of still photographs to which motion is somehow added from the outside, but as an image directly and immediately in motion, a moving picture, or movement-image.*[85]

*Film. Kinetic relationships of projected light.*[86]

Moholy-Nagy thought that together with photography, film was another medium of the future that had yet to be fully exploited. In his opinion 'film today is exclusively confined to the projection of a sequence of "stills" on a screen and it is apparently not generally realised that mobile spatial projection is the form of expression most appropriate to this medium'.[87] In Moholy-Nagy's view the problem was that film was 'generally perceived and approached – in a traditional sense'[88] in which there was a 'recording [of] the visual and acoustic reality and reproducing it in two dimensional projection'.[89] Moholy-Nagy stated that the complexity of the problem in modern film could only be understood if there was a careful examination of the most important aspects of film. These were in his opinion 'the optical sphere (vision), the kinetic sphere (motion)' and 'the acoustic sphere (sound)'.[90] Referring to Malevich's 'a white square on a white canvas' (1918), Moholy-Nagy described his work as 'a remarkable example of the new cultural outlook' and 'might be regarded as an intuitive victory over the misguided efforts of the present-day film, which is more or less successfully imitating the out-dated technique of easel painting in its pictorial composition, its not in-frequent lack of movement'.[91] Moholy-Nagy stated that 'Suprematism superannuated a clean slate of manual craftsmanship in painting'.[92] In this statement Moholy-Nagy saw the impossibility for film to 'revert to the aesthetics of the easel picture', just as in the case of Malevitch 'painters are venturing on new courses'.[93] Moholy-Nagy did not suggest that painting was obsolete in the future; rather, he was concerned with the full exploitation of new techniques. Moholy-Nagy suggested that film should not rely on an 'alien technique of pictorial art' but exploit the 'specific possibilities' offered by the new medium. This exploitation should consider 'direct light morphosis and kinetic and refractory light displays' which would need to be carefully investigated in order to achieve new optical creations.[94]

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[85] Ronald Bogue, *Deleuze on Cinema*, (New York and London: Routledge, 2003), p. 22.
[86] Lazlo Moholy-Nagy, 'Production-Reproduction' *[Produktion-reproduktion] De Stijl,* (1922) no.7, pp. 97-101, reprinted in Krisztina Passuth, *Moholy-Nagy*, (London: Thames and Hudson, 1985), pp. 289-290, 290.
[87] Laszlo Moholy-Nagy, 'Problems of the Modern Film', *Korunk*, (1930), no 10, pp. 712-719, reprinted in English in *New Cinema*, 1934, No. 1, and *Telehor* (Brno), 1936. Reprinted in Krisztina Passuth, *Moholy-Nagy*, (London: Thames and Hudson, 1985) pp. 311-15, 311.
[88] Moholy-Nagy, 'Problems of the Modern Film', p. 311.
[89] Moholy-Nagy, 'Problems of the Modern Film', p. 311.
[90] Moholy-Nagy, 'Problems of the Modern Film', p. 312.
[91] Moholy-Nagy, 'Problems of the Modern Film', p. 312.
[92] Moholy-Nagy, 'Problems of the Modern Film', p. 312.
[93] Moholy-Nagy, 'Problems of the Modern Film', p. 312.
[94] Moholy-Nagy, 'Problems of the Modern Film', p. 312.

Moholy-Nagy's initial ideas concerning motion were present in the experiments of Russian montage. However, he outlined that 'montage alone by no means exhausts the possibilities inherent in motion' and that 'the Russian directors' sense of motion is impressionistic rather than constructive' and Moholy-Nagy believed that the particular success of montage resided 'in the use of associative impressions'.[95] His suggestion for 'the constructive montage of the future' was to give more attention to the 'totality of the film – in light, space, motion, sound – than to the film as a sequence of striking visual effects'.[96] In his view attention to the totality of the film would offer for example 'the simultaneous projection of a number of complementary films' which 'has so far not been attempted'.[97]

When discussing sound, which Moholy-Nagy saw as the third area of film, he found it 'one of the most important inventions of our time' with a capability to 'enlarge [...] consciousness'.[98] For Moholy-Nagy this could be achieved only with new experiments in which sound units 'are traced directly on to the sound track and [...] translated into actual sound in the process of projection'.[99] Such a process could also be visualized and would involve 'drawn profiles, letter sequences, finger prints, geometrical signs printed on the track [...] producing surprising acoustic effects'.[100]

In order to create a different kind of modern film Moholy-Nagy was interested in pushing the boundaries of projection with visual and kinetic effects being combined together with new sound technology:

> *It is our task to achieve a true opto-acoustic synthesis in the sound film, which will immeasurably surpass public taste that is still captivated by the novelty of this medium. In the last resort such a synthesis inevitably implies the emergence of abstract sound film, which will provide invaluable examples for all other types of films. The 'documentary sound film' and the 'abstract sound film' will be reinforced by the 'montage sound film', by which must be understood not merely montage of the optical and acoustic sections, but a mutually integrated montage of both.*[101]

Moholy-Nagy's visions about modern film have been only partially realized in his own work. His film 'Light Display: Black-White-Grey' (1930) *(Fig. 5.14)* is based on his 'Light-Space Modulator for an Electric Stage' *(Fig. 5.15)*, 'created in 1930 by Laszlo Moholy-Nagy for 'the 20e Salon des Artistes Decorateurs Francais' in Paris'.[102]

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[95] Moholy-Nagy, 'Problems of the Modern Film', p. 313.
[96] Moholy-Nagy, 'Problems of the Modern Film', p. 313.
[97] Moholy-Nagy, 'Problems of the Modern Film', p. 313.
[98] Moholy-Nagy, 'Problems of the Modern Film', p. 313.
[99] Moholy-Nagy, 'Problems of the Modern Film', p. 314.
[100] Moholy-Nagy, 'Problems of the Modern Film', p. 314.
[101] Moholy-Nagy, 'Problems of the Modern Film', p. 314.
[102] Laszlo Moholy-Nagy, 'Light Display: Black-White-Grey', (1932), (document.) by Jean Paul Goergen, Helen Adkins (trans.), from *m-n 100, [Zum 100, Geburtstag von Laszlo Moholy-Nagy]*, 20 Juni 1995, (Berlin: BAUHAUS Archive), pp. 2-3.

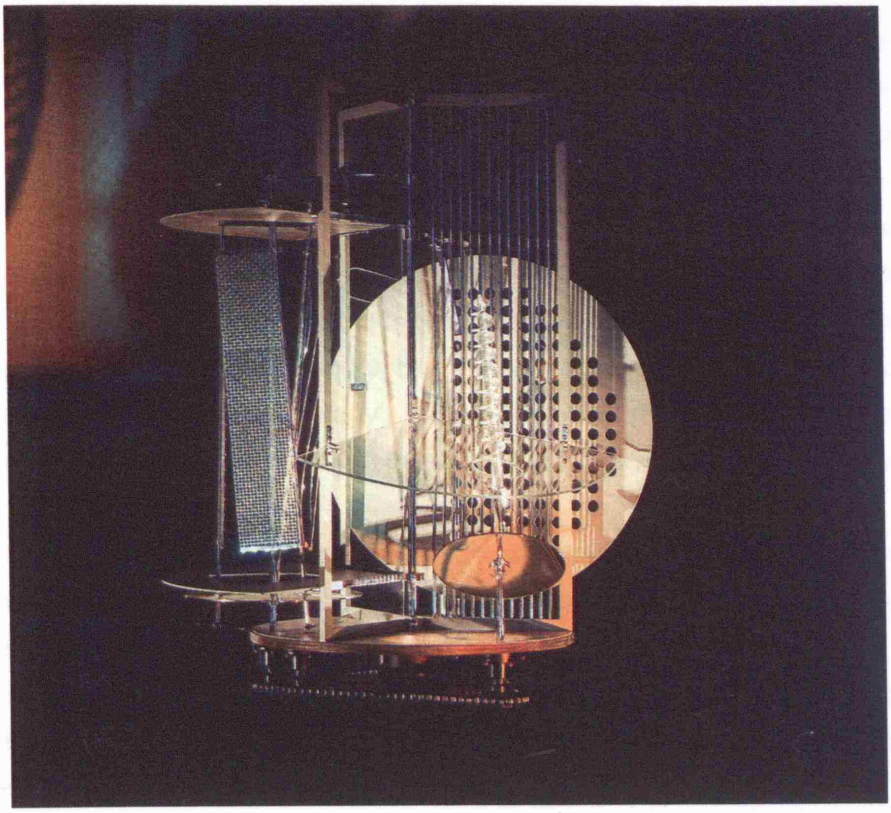

Fig. 5.15. Laszlo Moholy-Nagy, stills from the film *Light Prop for an Electric Stage*, (1928-30) (replica 1970), metal, plastic and wood, 151x70x70 cm, Collection Van Abbemuseum, Eindhoven, rpt. in *Albers and Moholy-Nagy: from the Bauhaus to the New World*, Achim Borchardt-Hume (ed.), London: Tate Publishing, 2006), p. 53.

Although, the film Light Display: Black-White-Grey' was based on 'Light-Space Modulator' it 'is not a documentation of this "light piece" but a work in its own right that transfers the light effects and movements of the kinetic sculpture into the realm of film'.[103]

However, before discussing in detail the effects of the film it is important to understand the process that preceded it. The creation of the 'Light-Space Modulator' (later adapted by AEG theatrical department into the 'Light-Space Modulator for an Electric stage') was a project that Moholy-Nagy conceived as an idea in 1922 when according to Passuth he 'had even drawn the plans' but it was only in 1930 that he managed to complete it with technical help.[104] Passuth states that 'Light-Space Modulator is one of the finest and most clearly expressed creations not only of Moholy-Nagy's individual artistic aspirations but of the avant-garde new aesthetics of the entire period'.[105] She compares it to 'machine art', 'a tendency typical of the twentieth century and especially of Dada and Constructivism' and also to Naum Gabo's 'Kinetic Statue: Standing Wave' *(Fig. 5.16)* and Moholy-Nagy's 'Nickel Sculpture' *(Fig. 5.17)* which seem to be 'related to the theory of dynamic-constructive system of forces' though both are 'static' works.[106]

Naum Gabo also experimented with real motion suggesting that 'time could only become an element of art if the real movement of substantial masses was involved'.[107] Furthermore, according to Barassi his 'Kinetic Construction: Standing Wave' 'remained an experiment' and 'his dissatisfaction with the limitations imposed by technology later led Gabo to investigate the possibility of reversing the dynamic relationship between sculpture and viewer, utilising, for example, the movement of the latter'.[108]

Moholy-Nagy was aware of Gabo's experimentation with motion and in his earlier experiments before the construction of 'Light-Space Modulator' he was concerned with what he called 'equipoised sculpture' that was 'made in glass or other translucent materials and suspended using thin transparent wires, magnetic forces or electric remote control'.[109] Such '"kinetic equipoise" would go even further: in it volume relationships would be virtual, "resulting mainly from the actual movement of the contours, rings, rods, and other objects"'.[110] What is of particular importance with Moholy-Nagy's experiments is that '"the materials are employed as a vehicle for motion"' and '"to the three dimensions of volume, a fourth-movement – (in other words, time) is added"'.[111] In addition Moholy-Nagy underlined the importance of light saying

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[103] Moholy-Nagy, *m-n 100*, p. 2.
[104] Krisztina Passuth, *Moholy-Nagy*, (London: Thames and Hudson, 1985), p. 55.
[105] Passuth, *Moholy-Nagy*, p. 53.
[106] Passuth, *Moholy-Nagy*, p. 53.
[107] Sebastiano Barassi, 'New Visions for a New World', *Brancusi Gabo Moholy-Nagy Immaterial:*, catalogue of the exhibition in Kettle's Yard, University of Cambridge, 17 January - 14 March 2004, (Cambridge: Kettle's Yard publications, 2004), pp. 5-46, 34.
[108] Barassi, Brancusi Gabo Moholy-Nagy Immaterial:, p. 34-5.
[109] Barassi, Brancusi Gabo Moholy-Nagy Immaterial:, p. 35.
[110] Laszlo Moholy-Nagy, The New Vision, cit., p. 47 quoted by Sebastiano Barassi, 'New Visions for a new world', *Brancusi Gabo Moholy-Nagy Immaterial:*, catalogue of the exhibition in Kettle's Yard, University of Cambridge, 17 January-14 March 2004, (Cambridge: Kettle's Yard publications, 2004), p. 35.
[111] Barassi, 'New Visions', p. 35.

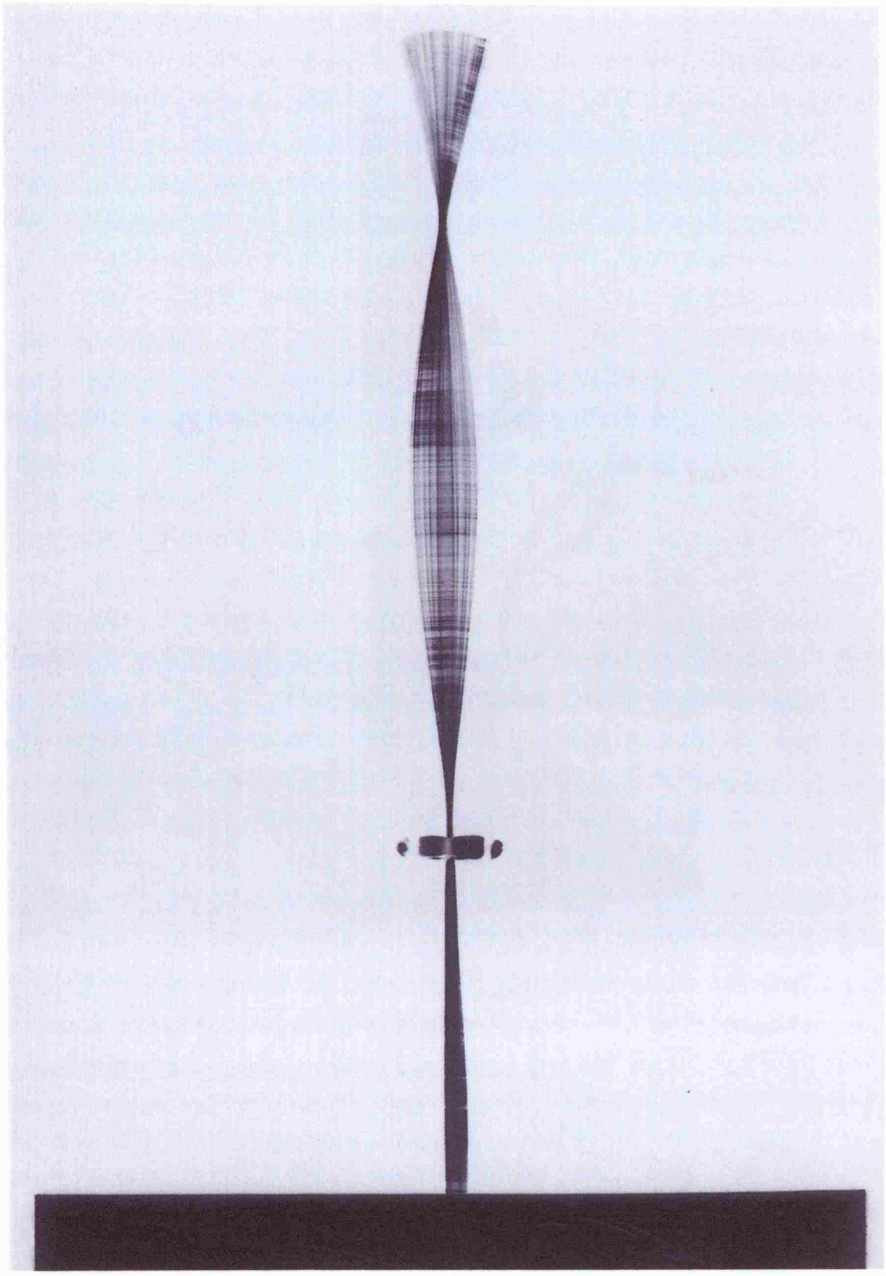

Fig. 5.16. Naum Gabo, *Kinetic Construction [Standing Wave]*, (1919-20) (replica 1985), cat. no. 25, rpt. in *Brancusi Gabo Moholy-Nagy Immaterial*: catalogue from the exhibition in Kettle's Yard, University of Cambridge (17.1-14.3.2004), (Cambridge: Kettle's Yard publications, 2004), p. 55.

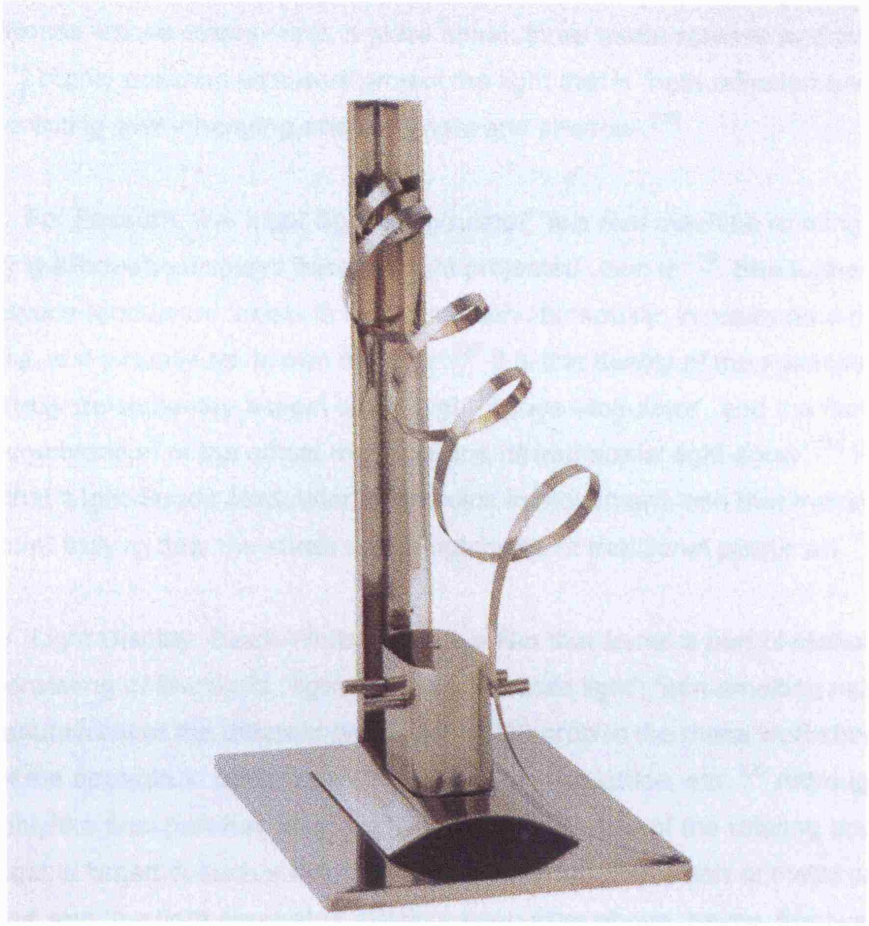

Fig. 5.17. Laszlo Moholy-Nagy, *Nickel Sculpture* (1921), rpt. in *Albers and Moholy-Nagy: from the Bauhaus to the New World*, Achim Borchardt -Hume (ed.), (London: Tate Publishing, 2006), p. 82.

that '"light-as a time-spatial energy and its projection – is an outstanding aid in propelling kinetic sculpture, and in attaining virtual volume"'.[112]

For Sebastiano Barassi 'the Light-Space Modulator represented the culmination of this research'.[113] Barassi describes the machine as a 'mechanical apparatus' consisting of 'three metal frames whose edges meet, a glass spiral, three metal screens and two perforated metal discs'.[114] Highly polished elements project the light that is 'both reflected and modulated by these, creating ever-changing effects of light and shadow'.[115]

For Passuth, the 'Light Space Modulator' 'is a real machine rotating, moving, and producing silhouette displays from the light projected upon it'.[116], She further suggests that 'Light-Space Modulator' 'exists in two forms simultaneously: in reality as a metal-and-glass structure, and virtually as its own shadow'.[117] It is this duality of the machine that Barassi sees as 'the truly revolutionary aspect of the Light-Space Modulator', and the fact that 'it only exists as the combination of the actual machine and its immaterial light-show'.[118] Furthermore, Barassi states that 'Light-Space Modulator' only exists in movement, and that makes it the first "sculpture" truly to defy the stasis and weightiness of traditional plastic art'.[119]

'Light Display: Black-White-Grey' is a film that forms a part of Moholy-Nagy's larger work consisting of few parts: 'light, especially artistic light', 'iron-smelting mill' 'theatre, opera', and manufacture of the different parts of the light prop in the metal workshop', and 'individual parts of the apparatus: perforated tin sheet, wire grid, lattice, etc'.[120] Although part of a larger work, only the final part has been realized as 'the shadow of the rotating apparatus'.[121] The apparatus is filmed in such a way that there is a 'superimposition of metal details with the shadows' and 'the light apparatus rotating: seen from above, below, frontward, backwards, in normal, accelerated and retarded motion'.[122] Moholy-Nagy describes the effects in the film: 'views through small openings', 'positive, negative pictures', 'fading', 'prisms', 'rotation increases' and 'in the end everything dissolves in light'.[123]

According to Jean Paul Goergen, Moholy-Nagy conceived 'Light Display: Black-White-Grey' as an experiment to expand time.[124] It seems that 'the film refers to nothing else than its

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[112] Laszlo Moholy-Nagy, *The New Vision*, p. 50 requoted by Sebastiano Barassi New visions for a new world, from *Brancusi Gabo Moholy-Nagy Immaterial:*, catalogue of the exhibition in Kettle's Yard, University of Cambridge, 17 January - 14 March 2004, (Cambridge: Kettle's Yard publications, 2004), p. 35.
[113] Barassi, 'New Visions', p. 35.
[114] Barassi, 'New Visions', p. 35.
[115] Barassi, 'New Visions', pp. 35-8.
[116] Passuth, *Moholy-Nagy*, p. 53.
[117] Passuth, *Moholy-Nagy*, p. 53.
[118] Barassi, 'New Visions', p. 38.
[119] Barassi, 'New Visions', p. 38.
[120] Laszlo Moholy-Nagy, 'New Film Potentialities', *[A film uj lehetosegei, (Fekete, feher es szurke filmjatek)]*, *Munka*, 1932, no 24, pp.685-687, rpt. in Krisztina Passuth, *Moholy-Nagy*, (London: Thames and Hudson, 1985), pp.317-18, 318.
[121] Moholy-Nagy, 'New Film Potentialities', p. 318.
[122] Moholy-Nagy, 'New Film Potentialities', p. 318.
[123] Moholy-Nagy, 'New Film Potentialities', p. 318.
[124] Moholy-Nagy, *m-n 100*, p. 2.

own movements and shades, thereby rejecting spatial orientation and time reference'.[125] Moholy-Nagy thought that 'time expansion is supported by repetitions and a specific slowness of movement'.[126]

The experiment consisted of building a machine, the 'Light-Space Modulator' and creating the film 'Light-Display: Black-White-Grey'. It reflected Moholy-Nagy's desire to explore motion, both in terms of escaping from material and letting light create the movement on the screen. For Moholy-Nagy it was an experiment into the moving image that could contribute towards new spatial relationships. Barassi underlines the crucial role of the moving image in the development of Moholy-Nagy's art. For him, the 'Light-Display: Black-White-Grey' 'epitomises the artist's idea of film as the highest expression of an art combining the modern artistic materials of light and movement'.[127] What the film demonstrates is the 'Light-Space Modulator' 'in motion, emphasizing its mesmerising play of light and shadow' and allowing for something 'completely virtual, just a projection of light, without the weight of physical materials'.[128]

According to Martin Hammer and Christina Lodder the 'Light-Space Modulator', with its 'projection of lights onto the construction, creating strong shadows, reinforces the intricate interplay between material and immaterial',[129] while the film 'Light Display: Black-White-Grey' according to Hermann Gressieker is 'a linkage between deliberately created light and shade effects of movement, and at the same time the transfer of our sense of space (of the "spatial question") to the two-dimensionality of film'.[130] What Moholy-Nagy achieved with these artworks was two-fold. Firstly, with a moving machine on which light was projected Moholy-Nagy created a heightened awareness of the relationship between the material and immaterial. Secondly, the film itself captured this relationship in three colours: black, white and grey producing an effect of a motion drawing, an animated play of lines and planes in monochrome. The relationship between the material and the immaterial of the 'Light-Space Modulator' seems to dissolve boundaries of space through light and shadow projections. The film 'Black-White-Grey' depicts such a space collapsed into a kind of drawing – a particular film technique transforms a motion image into a motion drawing.

Moholy-Nagy was concerned with the relationship of material and architecture. In his book *From Material to Architecture* (later translated as *The New Vision*) *(Fig. 5.18)* he describes space as not having 'to do with a "sculptural" exterior, but instead with relations' where 'in architecture not sculptural patterns, but spatial relations are the building elements'.[131] Although,

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[125] Moholy-Nagy, *m-n 100*, p. 2.
[126] Moholy-Nagy, *m-n 100*, p. 2.
[127] Barassi, 'New Visions', p. 42.
[128] Barassi, 'New Visions', p. 42.
[129] Martin Hammer and Christina Lodder, 'Dematerialising Sculpture; Methods and Motives', from *Brancusi Gabo Moholy-Nagy Immaterial:*, catalogue of the exhibition in Kettle's Yard, University of Cambridge, 17 January - 14 March 2004, (Cambridge: Kettle's Yard publications, 2004), pp. 47-70, 54.
[130] Hermann Gressieker, *Filme von Moholy-Nagy*, in Berliner Borsen-Courier, 5 March 1932, no 110, quoted in Laszlo Moholy-Nagy, 'Light Display: Black-White-Grey', (1932), document by Jean Paul Goergen, Helen Adkins (trans.), from *m-n 100*, Zum 100, Geburtstag von Laszlo Moholy-Nagy, 20 Juni 1995, (Berlin: BAUHAUS Archive), p. 2.
[131] Moholy-Nagy, *The New Vision,* p. 63.

in his kinetic sculpture Light-Space Modulator, Moholy-Nagy used real material, which he set in motion and projected light onto he demonstrated how the sculpture could in effect become 'dematerialised'. The 'Light-Space Modulator' was a piece of work with an intricate combination of material, motion and light in which a form of 'dematerialization' was achieved. Moholy-Nagy's desire for forms of 'dematerialisation' is also expressed in the earlier photogram experiments which 'gave "tangible shape to light itself"', and dematerialise any three-dimensional object' [132]. For Geraldine Johnson, photography, along with the photogram was for Moholy-Nagy '" the most completely dematerialised medium"'.[133] The 'Light-Space Modulator' demonstrated complex 'exchanges between two and three dimensions, between motion and stasis, between transparency and opacity'[134] where forms of 'dematerialization' altered spatial relations. The light and shadows captured on the film 'Light Display: Black-White-Grey' were exchanges between two and three dimensions and the film at times appears as if it is a moving photogram, or a photograph in motion *(Fig. 5.14)*. Moholy-Nagy outlined the possibilities of such dimensional exchanges suggesting that: 'by using light and shadow systematically, film will conquer a whole domain of its own [...] by employing light consciously [...] an endlessly rich gradation can be produced, from the light-flooded white to deep black and subtle greys'.[135] The movement image produced by the film 'Black-White-Grey' veers into the borderline between matter, light and motion and seems to create in its black-white-grey displays an animated drawing in space.

Deleuze states that the film comprises twenty-four 'photogrammes', which he calls the 'immobile sections' and there are twenty-four of them per second. However, what he states is that the film does not give a photogramme, but what the film gives us 'is an intermediate image, to which movement is not appended or added; the movement on the contrary belongs to the intermediate image as immediate given'.[136] In other words Deleuze states that 'cinema does not give us an image to which movement is added, it immediately gives us movement'.[137]

Tom Conley suggests that according to Deleuze, who refers to Henri Bergson, 'the cut between two shots is part of that image, and thus a temporal gap that allows the eye to perceive an effect of movement'.[138] However, this gap is not to be understood as a 'succession [...] of static photographic poses but of "instants of any kind whatsoever", that is of instants equidistant from one another'.[139] These are instants of temporal nature and for Deleuze according to

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[132] Geraldine A. Johnson, '"An Almost Immaterial Substance": Photography and the dematerialization of Sculpture', from *Brancusi Gabo Moholy-Nagy Immaterial:*, catalogue of the exhibition in Kettle's Yard, University of Cambridge, 17 January – 14 March 2004, (Cambridge: Kettle's Yard publications, 2004), pp. 71-85, 77.
[133] Johnson, 'An Almost Immaterial Substance', p. 77.
[134] Johnson, 'An Almost Immaterial Substance', p. 78.
[135] Moholy-Nagy, 'New Film Potentialities', p. 317.
[136] Gilles Deleuze, *Cinema 1: The movement-image*, Hugh Tomlinson and Barbara Habberjam (trans.), (Minneapolis: University of Minnesota Press, 1986,) p. 2.
[137] Deleuze, *Cinema 1: The movement-image*, p. 2.
[138] Tom Conley, 'Movement-image,' quoting Deleuze from *Cinema 1: The movement-image*, Hugh Tomlinson and Barbara Habberjam (trans.), (Minneapolis: University of Minnesota Press, 1986,) pp. 2, 7-8, *The Deleuze Dictionary*, Adrian Parr (ed.), (Edinburgh: Edinburgh University Press, 2005), p. 174.
[139] Conley, 'Movement-image', p. 174.

Conley 'the event of movement image thus owes to a "distribution of the points of a space or the moments of an event", a moment seen as a "translation in space"'.[140]

If we are to consider the 'Light-Space Modulator' as an event in space then the play of light and shadows that the machine emits which is projected onto the background surface and captured on film, suggests that such a film captures a distribution of points of space and moments of the rotating event of the machine. In this sense, the capturing of the distribution of points of space and rotating moments could be seen as translation from the material, the machine, into the immaterial, light and shadow.

According to Deleuze, the image is not inseparable from matter, as '"the in-itself of the image is matter", and there is an "absolute identity of the image and movement" such that "image-movement and matter-flow are strictly the same thing"'.[141] We can start to conceptualize images of the rotating machine and its black, white and grey projections of light and shadow recorded in the film as matter and image together. In the case of Light Display Black-White-Grey the abstract images look as they are spatially drawn by light and shadow.

For Deleuze 'the image is matter: not something hidden behind the image, but on the contrary the absolute identity of the image and movement'.[142] In other words, for Deleuze 'the movement-image and flowing-matter are strictly the same thing'.[143] For Deleuze as he is quoted by Ronald Bogue '"the identity of the image and movement has as its reason the identity of matter and light [...] the image is movement as matter is light"'.[144] Bogue states that Deleuze suggests that 'the eye is in things [...] and what actualizes virtual movement-images is the "centre of indetermination" [145] of a living image, an interval or gap in the universal interaction of matter-flows'.[146] According to Adrian Parr in terms of art these images and the interaction with matter flows become a space where 'art has a potential to create conditions wherein new connections and combinations can be drawn-socially, linguistically, perceptually, economically, conceptually and historically'.[147] Parr takes the example of Antonin Artaud, 'a favourite of Deleuze and Guattari whose animated drawings [...] capture a sense of physical and psychical exhaustion, an exhaustion that is intensified by the anarchic language he develops through combination of colours, words, sounds and forms' [...] ' the lines of which strip away systems of signification'.[148] Parr further suggests that 'we could use Deleuze and Guatarri's concept of a "line of flight" to consider how Artaud's work prompts us to think differently, to sense anew and

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[140] Conley, 'Movement-image', pp. 174-175.
[141] Ronald Bogue 'Image, Movement, Matter, Light' quoting Deleuze form *Cinema 1: The movement-image*, Hugh Tomlinson and Barbara Habberjam, (trans.), (Minneapolis: University of Minnesota Press, 1986), pp. 86-7 and 59, *Deleuze on Cinema*, (New York and London: Routledge, 2003), p. 33.
[142] Deleuze, *Cinema 1: The movement-image*, p.61.
[143] Deleuze, *Cinema 1: The movement-image*, p.61.
[144] Bogue, 'Image, movement', p. 34.
[145] For Bogue there are 'certain images for which an action does not lead directly to an opposite and predictable reaction' and 'such images are living beings which may be defined as "centers of indetermination" in the work of Deleuze. See Bogue, 'Image, Movement', p. 30.
[146] Bogue, 'Image, Movement', p. 35.
[147] Adrian Parr, 'Lines of Flight + Art + Politics', *The Deleuze Dictionary*, Adrian Parr (ed.), (Edinburgh: Edinburgh University Press, 2005), pp. 146-8, 147.
[148] Parr, 'Lines of Flight', p. 147.

be exposed to effects in unpredictable ways'.[149] Suggesting that 'a practice that dismantles conventional ways of thinking and acting, or one that stimulates upheaval by loosening up some of the rules and orders that organise individuals and social bodies is inherently political',[150] Parr makes a point concerning the particularity of innovative artistic practice and experimentation.

In respect to Moholy-Nagy's work on film 'Light-Display: Black-White-Grey' and the construction of his rotating sculpture-machine 'Light-Space Modulator' we can attribute to this work similar innovative significance. It is not that the film and the machine help us only conceive of different relationships between material and immaterial, matter and light, object and space relationships but also its experimental techniques suggest a broader influence in terms of conceiving the dematerialization of the object. In the words of Hammer and Lodder 'the trend towards so-called "dematerialization" of art, or the art object [...] a phrase often deployed, in the wake of its launch in the critical essay of 1968, to describe the dominant impulse in art since mid-1960s [...] signifies the way in which the hand-crafted pictorial or sculptural work of art was being supplanted by forms of creative expression that are inherently ephemeral and susceptible to multiple reproduction, such as performance, text, photography, video, site-specific installation, and so forth'.[151]

Moholy-Nagy's 'Light-Space Modulator' and 'Light Display: Black-White-Grey' can be regarded as two such instigators on many levels. Firstly, in terms of artistic technique they offered different spatial relationships, and, at the time challenged the relationship between matter and image. Secondly, in terms of the relationship between drawing and image the drawn line is replaced by a moving and animated line, a vector of a kind. Thirdly, in terms of challenge to the dissolution of the art object, and it's forms of reproduction, through different techniques, like a film, the work became suggestive of many other practices concerned with dematerialization of the art that were yet to come.

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[149] Parr, 'Lines of Flight', p. 147.
[150] Parr, 'Lines of Flight', p. 147.
[151] Martin Hammer and Christina Lodder, 'Dematerializing Sculpture; Methods and Motives', *Brancusi Gabo Moholy-Nagy Immaterial:*, catalogue of the exhibition in Kettle's Yard, University of Cambridge, 17 January-14 March 2004, (Cambridge: Kettle's Yard publications, 2004), p. 49.

## PART II: PRACTICE-LED RESEARCH: LINES OUT OF ARCHITECTURE

My research uses the line as the place for re-thinking the creative process spatially and temporally. I have extended architectural conceptions of the line beyond representation by moving it through different theoretical investigations and creative practices. In my own practice, which has been developing in parallel with my theoretical research, I have employed various lines: the making line, the drawing line, the programmed line, the projected line and the story-line to move my practice research from project to project. I use the line to 'walk' me through different creative processes and techniques. The projects I have done during the time of this thesis have explored in different forms of material outcome how lines may lead to architecture.

For me, lines of movement in a creative process indicate an architecture that is yet to come, and is a process of negotiation between matter and thought, between a drawing of architecture and the future of the architecture to come. This negotiation, in my opinion, is a process and happens through a conversation between theory and practice. I share Jane Rendell's view of theory and practice, in which she suggests that neither is practice 'an application' of theory nor is practice an 'inspiration' for theory but the relationships between the two are more 'fragmentary'.[1] I also share Rendell's view that the mobility between theoretical concepts and practice, occur in a way similar to Deleuze's discussion of "relays".[2] However, while a relay can be understood as a form of signal or transmission that is usually temporally quite short, a conversation can take a long time. Sometimes, the same conversation may last for years before it reaches closure, if it indeed ever does. The complex, intuitive, conceptual, analytical and active relationship that happens between ideas and their materialization during the creative process reminds me of a conversation, in which one may start with an idea but through conversation many new diverging and fragmentary trajectories may extend the original idea of the conversation, change it, re-shape it and re-work it.

A conversation starts with an initial idea, a topic or a proposition and, that through time, during the course of a conversation, may evolve, taking the conversation on unforeseen trajectories. These trajectories remind me of walking. In her book *Art and Architecture* Rendell discusses walking as a form of critical practice and suggests that walking may be 'a way of practising space through time and time through space', a way of 'rethinking place as unfixed and site as performed' and finally, 'as an activity [which] temporarily positions the subject in motion between a series of scenes'.[3] In the process of designing architecture there are series of different unpredicted trajectories that take us forward. I believe that between theoretical ideas

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[1] Jane Rendell, quoting Deleuze from 'Intellectuals and Power: A conversation between Michel Foucault and Gilles Deleuze', *Language, Counter-memory, Practice; Selected Essays and Interviews*, (New York and Ithaca: Cornell University Press, 1977), pp. 205-17, 'between two', *The Journal of Architecture*, Volume 8, Summer 2003, p. 226.
[2] Rendell, quoting Deleuze from 'Intellectuals and Power', 'between two', *The Journal of Architecture*, p. 226.
[3] Rendell, *Art and Architecture*, pp. 187-8.

and practical outcomes, architecture happens through a series of connections between the mobile, material, immaterial and projective properties of the line that 'walks'.

Reading philosophical ideas concerning becoming, duration, force, and the logic of invention from Gilles Deleuze and Elizabeth Grosz, and looking closely at Paul Klee and Laszlo Moholy-Nagy's creative practice has formed a particular constellation of ideas. In parallel to this formation, while working on my own practice I have found that my creative propositions drew on this constellation of ideas. At the same time my own practice intervened upon these ideas by making a mark, a kind of a proposition that further opened up new trajectories and forced a particular direction of research. Sometimes, architectural design practice acted as a particular punctuation mark to theoretical research, similar to the structuring of a sentence, and created a particular focus in meaning. At another times, practice would become the leading verb, the subject or a broad title for the future research.

The relationship between a particular project and the analytical research, for me, occurred in parallel, best compared to what Klee called the 'walk' of 'converging' and 'diverging' lines.[4] Sometimes, the walk would be, as in Klee's example of convergence, a walk of two friends in conversation along a path in the park. At other times the walk would diverge, the friends meeting and parting after a brief conversation in the park – each of them carrying away an idea from their short meeting.

The idea of a conversing while walking also suggests a path on which various forms of discovery may take place. In the process of this conversational walk a change of direction may result in either furthering analytical research or furthering practice. Both directions can be equally creative in exploring new ideas through different means. A conversational walk may have a final destination, but during the walk the process of discovery is more important than this final destination. I would like to suggest that research – both theoretical and practical – could be considered a form of conversational walk. Furthermore, a conversational walk is a form of exchange that is primarily concerned with what could best be described in Deleuze and Guattari's words as 'middle'. Deleuze and Guattari suggest that 'the middle is not at all an average – far from it – but the area where things take on speed'.[5] Following the suggestion that all things start in the middle, the middle then is more flexible, and propositions can emerge following unpredictable trajectories that move back as well as forward, and produce dynamic processes rather than static products.

Neither Klee nor Moholy-Nagy were interested in the beginning or the end of their own practice or research. Their research was also concerned with the middle – the middle of the creative process – and this position was not fixed either temporally or formally. For Klee,

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[4] Klee, 'Line, plane, and orientation in space', *Paul Klee Notebooks, Volume 1, The Thinking Eye* Jurg Spiller (ed.), Ralph Manheim (trans.), (London: Lund Humphries; New York: George Wittenborn, 1961), pp. 123-4.
[5] Gilles Deleuze and Felix Guattari, *On the Line*, John Johnston (trans.), (New York: Semiotext(e), 1983), p. 58.

'formation is good', while 'passive, finished form is bad'.[6] For Moholy-Nagy, space was concerned with spatial relationships and not building material.[7]

My own practice examples, that I go on to describe here, aim in a similar way to produce a dynamic way of making architecture. I consider them in relation to the concept of 'sand' that Catherine Ingraham mentions in her conclusions concerning architecture and its linearity.[8] Using the Deleuzian metaphor of sand, Ingraham's theoretical interest aims to search for the movement of individual grains of sand whose un-noticed motion alters the arrangement of the whole. Equally, I think of each of my own examples of practice as individual grains. Each example is a moment during the changing, or what I call mobile, practice of architectural design, while each one proposes a different way of understanding and working with the line in architectural design processes. Particularly focussing on the nature and property of the line, each example extends architectural concepts of the line through the execution of the work. More specifically, each project considers one or more of the properties of lines previously examined in chapters 1 to 5 in order to lead toward future architecture.

In **Project 1: 'Walking Feeling'** I describe the ideas that generated my first project 'Walking Feeling' (2002). This project is a performance project that was completed at the start of the research for this thesis and was concerned with location of tactile intuitions present in the vision. The project locates the body at the centre of my research investigations on the line. In **Project 2: 'Homely Rhythms'** I discuss my second project. 'Homely Rhythms' (2004-2006) ran in parallel with my research on the line in Klee's work and aimed to materialize the line through an architectural project inspired by Klee's notions of artificial and natural structures, as well as rhythm and function of the line, while also exploring the role of the body in space in an intimate encounter with the material surfaces of a home. In **Project 3: An Intermediate Project: 'Lines-Notes'** I discuss my drawing project entitled 'Lines – Notes' and presents a small selection of all the drawings that were done throughout the research on the thesis. These drawings were produced in such a way they assume the role of note-taking in which drawn lines can be seen as the scribbled notes of a text. The **Project 4: 'Line...Take Me for a Walk'** describes the ideas of the fourth project 'Line ... Take Me for a Walk' (2004) which was produced in response to a design competition for the UCL graduation ceremony and in which I explored different ideas for background surface and projected animated lines. This project was done in parallel with my research into Moholy-Nagy's ideas of breaking the background surface of projection screens and his different stage designs for theatre productions. The project extends Moholy-Nagy's ideas for the projection of light into the projection of lines, which, together with mobile screens, suggest different spatial relationships. In the final project of Part II **Project 5: 'An Epigrammatic Conversation with Klee on Line-endings: A Garden Project'** I conclude my

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[6] Paul Klee, *Paul Klee Notebooks, Volume 1, The Thinking Eye*, Jurg Spiller (ed.), Ralph Manheim (trans.), (London: Lund Humphries, 1961), p. 169.
[7] Laszlo Moholy-Nagy, *The New Vision*, (New York: George Wittenborn, Inc., fourth revised edition, 1947), p. 62.
[8] Catherine Ingraham, *Architecture and the Burdens of Linearity*, (New Haven and London: Yale University Press, 1998), p. 153.

practice investigations in this thesis by describing a 'conversation' between Klee and myself. Reading Klee's Diaries in which he described many of his travel experiences I looked especially at his epigrams on line-endings. I suggest that Klee's words on line-endings are not themselves endings but openings for some of the developments he makes in his painting and drawing. Using words from a particular epigram I transfer them as instructions into a computer program which animate three of Klee's own mediating line diagrams. By animating these three original drawings by Klee on mediating lines my work creates a different kind of project that escapes original geometrical shapes and creates an imaginary, artificial, growing garden. The project extends Klee's ideas concerning the mobility of the line and relates this to Klee's own love of nature. While this was the 'final' project done during the research for this thesis the project resists the closure of the conversation, in this instance between my research on Klee and my design work, and instead it offers further possibilities to extend the conversational walk between theory and practice.

**PROJECT 1: 'WALKING FEELING'**

'Walking Feeling' (2002) aimed to explore the tactile intuitions involved in vision. The project worked at the boundary between vision and tactile intuitions. It consisted of a performance in which a specially designed body model was worn by an observer and performer who moved through a crowded public space in central London.

The idea of 'Walking Feeling' started as a highly intuitive reaction to the feeling of 'blindness' that one may experience in a visually crowded urban space. While performing a walk through the densely crowded space of Piccadilly Circus, the performer's body, which was carrying an instrument of vision, drew the public's attention. This instrument of vision was a camcorder attached to a 'body model' that consisted of a sharp stainless steel protrusion fixed to a transparent plastic waistband shaped to fit the performer. The body model hung from the performer's waist, and could be positioned in such a way that the camcorder could be directed either looking forward or backwards.

Picadilly Circus in London has an underground junction, a consumer district and an urban square. It is a site for commercial display, electronic billboards and a traffic junction. It is a place of multiple visual and social intersections, alive by day and night. Perceptions in this space are of a highly transitory nature, mainly based on the speed of movement, and tend to be highly visual in nature. Although a densely occupied space, Piccadily Circus is probably one of the least socially intimate spaces in London – the main kind of social encounters are transitory and involve mainly visual contact at close-quarters between moving strangers.

By positioning an instrument of vision, a camcorder, at the performer's waist and drawing the public's attention to the middle of her body, the project aimed to provoke a moment of reflection in the passers-by, producing a slowing of time in this experience. The body model was designed in such a way that it could be worn facing forward or backward and while wearing it the performer's walk aimed to instigate momentary pauses in the city audience. *(Fig. P.1.1)*

The performer's walk with the camcorder had an additional purpose. The camcorder was positioned at the waistline, the location commonly believed to be the place where feelings reside. We often describe, for example, that our reaction to some event as a 'gut–feeling'. The aim therefore was to position vision at the corporeal level of feeling – the gut.

The walk was recorded on film. The films produced by the camera had no purpose except to mark the walking line of the performer. The sight of a camera recording a walk aimed to provoke these questions in the urban passer-by: 'Can vision exist without feeling' and 'Is there a tactile vision?

Fig. P.1.1. Ivana Wingham, *Walking Feeling*, photograph of a performance project, London, 2002.

Walking a particular line in a public space in the city is a common practice of every city dweller. It is also common that such walks are mostly singular, lonely and rushed, and made with particular destination in mind. This performer's walk was different and wearing the sharply extruding element of the body model made this walk even more unusual. The body model could be understood as a shielding device protecting the performer from the crowd and from an intimate physical encounter. It could also be understood as emphasizing the hiding of feelings from the world around us, as well as our need for protection from overwhelming publicly induced visual stimuli. As such, the body model as object and the performance as process aimed to critique the dominance of the visual and its separation of the intimacy of the tactile. The walk prevented close encounters like an embrace, a kiss or even a limited handshake. The artifact provided an obstacle, both physically and mentally, for any communication beyond the purely visual. The body model aimed to draw attention to the missing ingredient in purely visual communication – the tactile element of our feelings. *(Fig. P.1.2)*

Klee suggested that there are 'non-optical ways' contributing to the artist's vision. These non-optical ways lie both above and below the eye's usual focus, and contribute to the artist's vision and his or her production of actual images. Through these so-called 'non-optical ways' the influences and intensities that enter the body of the artist extend the field of the visual to include the tactile.[9] While Elizabeth Grosz's work has stressed that the 'indeterminable position of the body' hovers 'perilously and undecidably at the pivotal point of binary pairs' [10] for Klee the body is a threshold where optical and 'non-optical ways' converge.

However, as well as the performance of this line, it is also interesting to revisit the ideas involved in the process of designing and making the 'body model' – and the way in which it was executed through particular forms of practice. During the process of making the model there was a continuous exchange between vision and the tactile intuitions in the relationship between hand and eye. For Klee, movement is expressed in a creative process through 'the initial impulse in ourselves' and 'the production of the work itself'.[11] This 'mobility' or interaction that exists between the initial impulse, the creation of a line, and the particularity of the result works between 'the sensing' and 'the sensed'. For Klee, 'the sensing' was a 'journey' through the experience of the world while the 'sensed' was his artistic interpretation of that world, the aim of which which was 'not to produce the visible' but to 'make visible'.[12]

The body-model's life started as a collage/drawing of the body's intermediate area – the waist – and aiming to 'make visible' ideas concerning intuition as gut-feelings. *(Fig. P.1.3)* The drawing was a hand-drawn ink-sketch of the waist, made of collaged newspapers with colour and sand-like black paste applied over the top. The role of the drawing was to accentuate the

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[9] Paul Klee, '"I" – "YOU" – "EARTH" – "COSMOS"' (trans. by author from original text in the diagram '"ICH" – "DU" – "ERDE" – "WELT""), *Paul Klee Notebooks, Volume 1, The Thinking Eye*, Jurg Spiller (ed.), Ralph Manheim (trans.), (London: Lund Humphries, New York: George Wittenborn, 1961), p. 67.
[10] Grosz, *Volatile Bodies*, pp. 23-4.
[11] Paul Klee, 'Graphic art', *Paul Klee and the Bauhaus*, Christian Geelhaar, (Bath: Adams and Dart, 1973), p. 29.
[12] Klee, 'Creative Credo', p.76.


Fig. P.1.2. Ivana Wingham, *Walking Feeling*, photograph of a performance project, London, 2002.

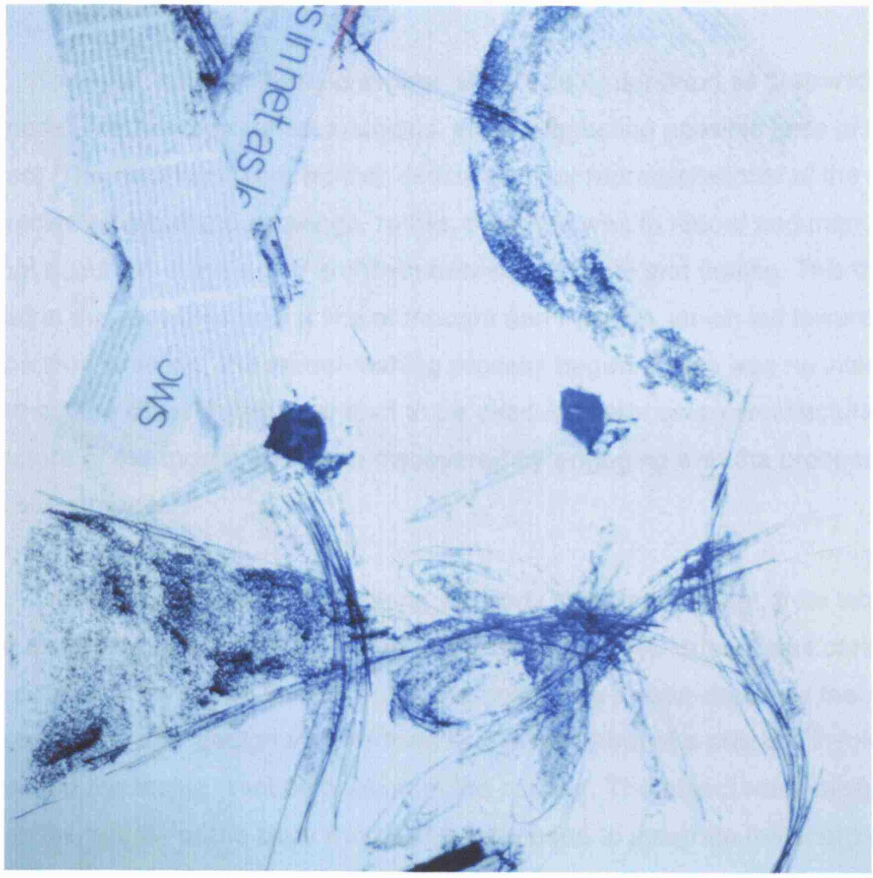


Fig. P.1.3. Ivana Wingham, *Walking Feeling*, photograph of an initial collage/ drawing, ink, newspapers, and paste on paper, London, 2002.

field of the body and its surrounding space and highlight the body's capacity to see with feeling. A second drawing, done in a similar fashion but without the collage, aimed to capture perceptions affecting the whole as a body. *(Fig. P.1.4)* The third drawing started to suggest the formation of the body model that consisted of a waistband and a protruding sharp element. *(Fig. P.1.5)*

However, none of these drawings should be understood as preparation for making the body model. Rather they reflect intuitions, each suggesting possible lines of movement towards an object. The drawings were neither descriptive nor representational of the object, nor were they precise architectural drawings, rather, their role was to record and mark a conversational path that occurred in the artist/ architect between thought and feeling. This conversational path depicted in the drawings was a line of thought and intuition, which led towards model-making. After the third drawing, the model-making process began. There was no intention to precisely draw an outline of an object or artifact to be executed later as an architectural model. The real architecture of the model was to be discovered by engaging with the process of making a one-to-one scale model.

The making started by wrapping the body in a plastic sheet, from which the waist could be cast in quick-drying plaster. *(Fig. P.1.6)* Once the plaster dried it was carefully cut to a shape that could easily be put on and taken off the body. The plaster-cast was then further built up using clay into a fully designed solid form that evolved out of a process involving the visual intuition and the tactile intuition present in the making. The object was polished. The receptacle space in the middle of the body model was later used to integrate the sharp element of the model. *(Fig. P.1.7)*

The second stage of making involved the casting of this model to provide a negative model or mould for resin. The idea was that the final model would be made out of resin so that it could be as transparent as possible in order to display the sharp element with the camcorder with as much contrast as possible. Combining the resin with the sharp stainless steel element that was to carry the camcorder, the body model was treated with a process of wet polishing. Finally, the model was finished to produce a shape that allowed the camcorder to be attached. *(Fig. P.1.8)*

Making the body model was a highly tactile process, and involved a series of steps in which different processes took place and in which decisions were made without prior drawings. Each cast of the model involved an encounter with different materials and different processes of making, in which it was tactile processes associated with vision that led to the final product. The initial idea and the aim of the body model was to critique the notion of vision as purely optical.

The 'Walking Feeling' project aims to articulate interaction or what I call the mobility that exists between the tactile and visual intuitions present in the body of a performer or walker while

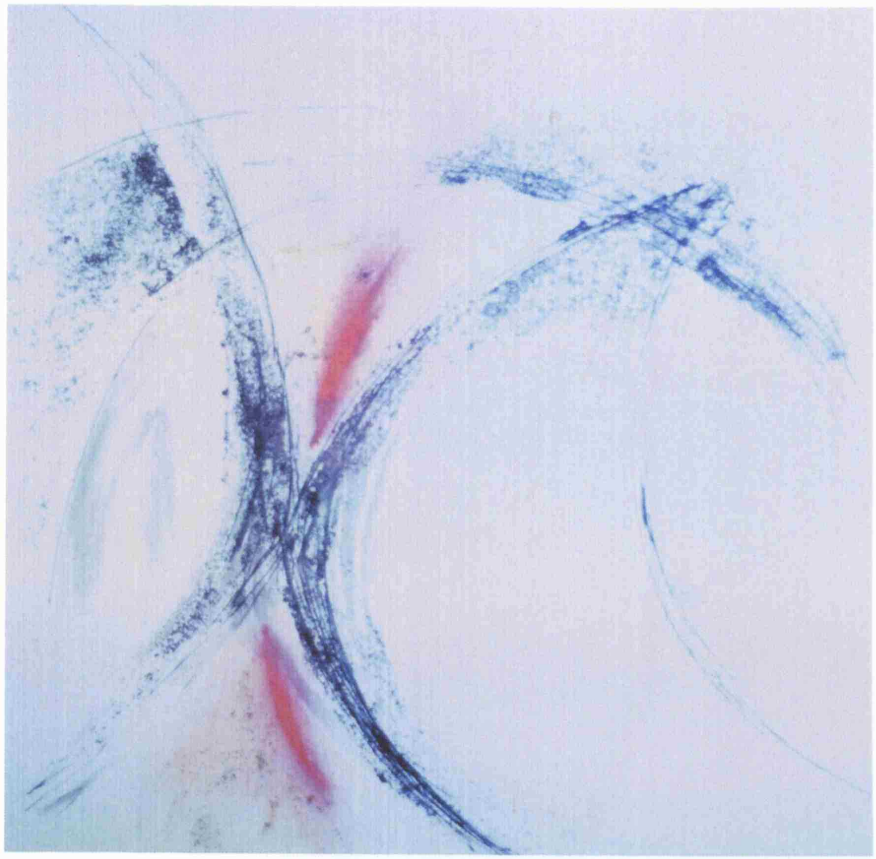

Fig. P.1.4. Ivana Wingham, *Walking Feeling*, photograph of a second drawing, ink, paste and colour on paper, London, 2002.

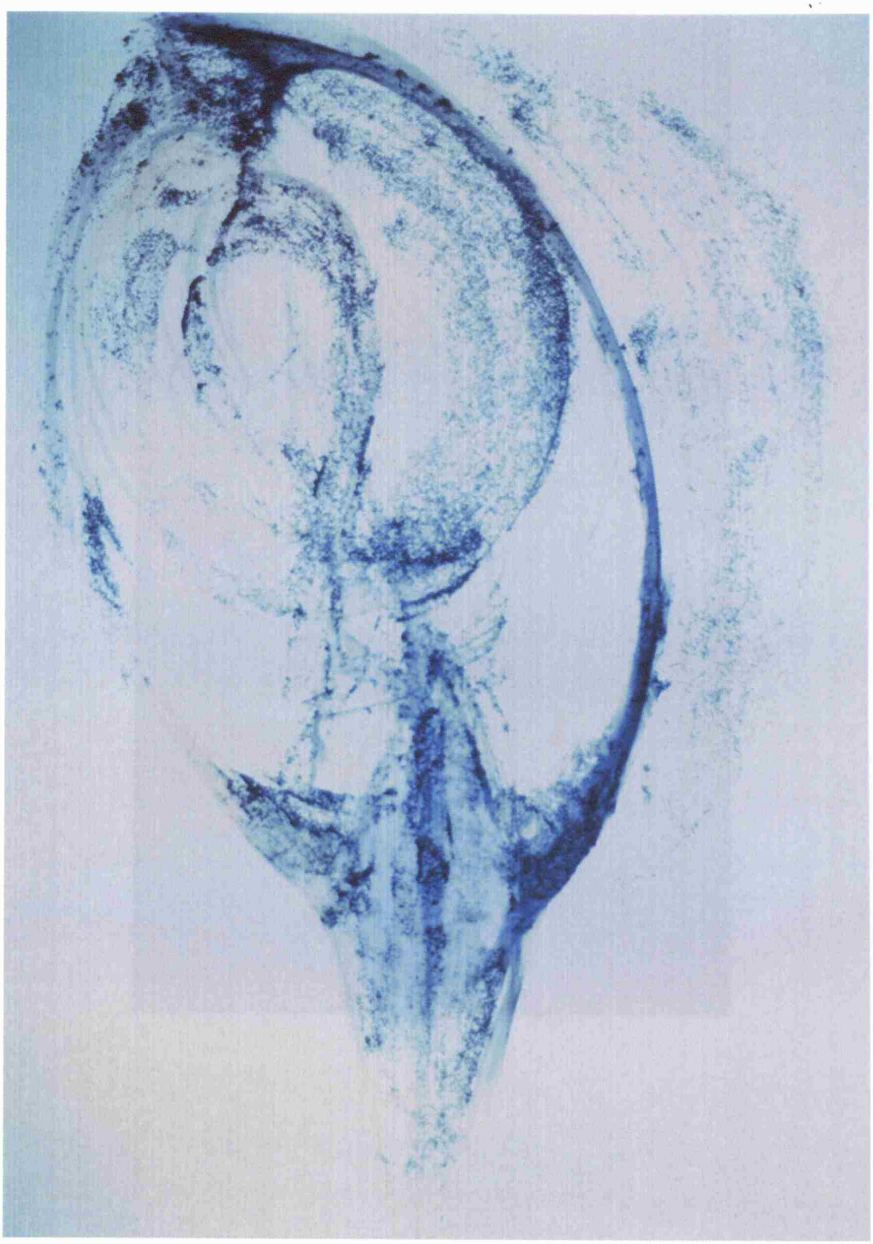

Fig. P.1.5. Ivana Wingham, *Walking Feeling*, photograph of a third drawing, ink and paste on paper, London, 2002.

Fig. P.1.6. Ivana Wingham, *Walking Feeling*, the making of a body model – stage 1, photograph, London, 2002.

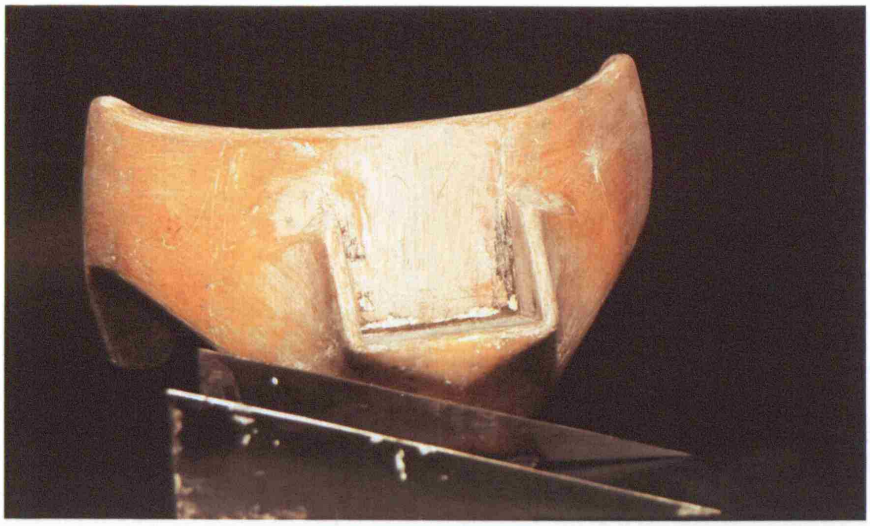

Fig. P.1.7. Ivana Wingham, *Walking Feeling*, the making of a body model – stage 2, photograph, London, 2002.

Fig. P.1.8. Ivana Wingham, *Walking Feeling*, body model – completed, photograph, London, 2002.

walking. Klee was concerned with a similar mobility and understood the relationship between the artist and the object in terms of exchanges of optical and non-optical ways of seeing. For me, what Klee calls a 'non-optical way' of seeing can be linked to Deleuze's understanding of sensation, where 'sensation has one face turned toward the subject (the nervous system, vital movement, "instinct", "temperament" ... and one face turned toward the objects (the "fact", the place, the event)'.[13] In my project 'Walking Feeling' I tried to alert the public to this exchange that takes place between optical and non-optical ways of seeing, suggesting a way we can sense the world around us through tactility rather than being over-sensitized with simply through pure visual and often highly technical stimuli.

The movement between the tactile and the optical happens through conversations between imagined and experienced lines that take place through processes that are material, temporal and spatial. These lines converge and diverge, joining and separating the visual and tactile, the body and space, and the hand and eye. This mobile line is both visible and invisible and is the site of exchange between theoretical ideas and material propositions. The best way to describe the property of this mobile line is as a 'walking feeling'.

[13] Deleuze, *Francis Bacon*, p. 34.

**PROJECT 2: 'HOMELY RHYTHMS'**

Inside houses many events occur. Moments of everyday life dominate the spaces of a home. Everything lies close to the body: beds, chairs, floors, cupboards, baths, the edges of walls. The home is a place where the body brushes with the architectural structure in a most intimate way. The objects and surfaces of the home brush against the body in motion, in ways that are intimate, tactile and sensory.

'Homely Rhythms' (2004-2005) considered the encounter between the body and material surfaces as an intimate and tactile encounter. The project started by thinking about ideas, which concerned everyday homely rhythms. Rhythm was taken to be a repetitive action through which the body encounters domestic surfaces. The first rhythm of the morning involves getting out of bed, moving from a lying position into a sitting position when the feet first touch the ground. While still in a state of slow awakening, the feet gently drop to the side of the bed and encounter the floor surface.

When we rise to an upright position from the intimate place of our beds, the floor is the first we encounter. 'Homely Rhythms' considered the floor to be an important surface, continuously in touch with the body. It is a surface to which, while we are at home, we are 'glued' to.

The 'Homely Rhythms' project began then by focusing on this most unifying surface, the floor, on which most everyday rhythms take place. The surface of the floor also forms an intermediary space between the inside of the house and the outside beyond the front door. Stepping out of bed onto the floor, getting out of the bath to the floor, going up and down the stairs from and onto the floor, going outside the house and returning to the house occur on the floor – the body at home encounters the floor in different terrains of intimacy. The floor is a connective agent, which links the body to various places, positions and activities in the home.

The floor must be made of a hard material, and yet different from that used outside in the street. It has to be immediately recognized as the surface where the life of the street stops and domesticity starts. I felt too that its materiality should be consistent throughout the house, so that in moving from one area of the house to another the body is not interrupted by the distraction of feeling the floor. I took the floor as a line of continuity throughout the house, one along which the variety of homely rhythms can happen.

The central concept of the floor design for 'Homely Rhythms' was to produce the minimum number of encounters with separating walls, therefore connecting the space throughout the home as if one room. Since it can relate to the past experiences of the body, the floor needed to be made of something familiar. I felt the choice of the material should have in mind a small child's first experience of encounters with the floor, in crawling, sitting and playing,

to fears of falling. Seen as a continuous surface and material line, the design of the floor was not to be interrupted by thresholds between the rooms. The floor was to continue its material surface across the stairs, and landings and even in its encounter with the walls.

If the floor surface is understood to be a place of action on which homely rhythms and encounters take place, the material changes made to its surface aimed to maintain its continuity and amplify its floating effect. The material changes in the surface gently indicated where changes of actions, encounters or rhythms might occur, yet, these were executed without disrupting the continuous flow of the floor's surface. For example, when the floor surface encountered the stairs, two encrusted lines at the edge of each wooden step were created to give the feeling of an edge and slow the feet down. *(Fig. P.2.1)* The consistency of the whole floor surface was broken into a rhythmical repetition of 'one – two – three' repetitive widths of wooden planks, creating a feeling of the uneven smoothness present in the original floorboards. *(Fig. P.2.2)* This uneven, but rhythmical nature of the floor boards was intended to remind the body of the imperfect nature of the original house floor, and to link the occupant to a house in which many other rhythmical actions had taken place in the past. In addition, the floor surface gave a sense of visual extension to the whole floor by flowing beyond the visible edges.

The floor's encounter with the wall emphasised another aspect of the floor's extension, creating a feeling of the floating surface of the floor 'going beyond' the edge of the wall. To achieve this feeling, the skirting board was designed as a double junction produced when two types of material work together. The shorter, lower part was slightly recessed and made of the same wood as the floor, while the upper, higher part overhung the shorter element slightly, creating a shadow gap. *(Fig. P.2.3)* The lower, shorter part of the skirting board produced a feeling that the floor was extending and its position was consistent and continuous with the floor surface running throughout the house. The higher, upper part of the skirting board created an area of encounter with the 'obstacles' of the walls rising above the floor.

The floor's edge and its encounter with domestic objects provided other places where homely rhythms were to take place. To maximise the floating effect of the floor, built-in furniture was dispersed to the edges of the floor boundary. Mobile furniture objects were designed to exchange places easily, depending on the rhythms of use and occupation of a particular room. The walls were opened at particular places, and doors hidden in the walls themselves, often hanging from the ceiling. These doors could emerge from the walls as large sliding elements when necessary to separate one room area from another.

The upright surfaces of the built-in elements allowed the intimate homely rhythms to take place in an immediate manner. There are no door-knobs or handles in the house. The sliding doors were narrowed to allow a hand to pull them from inside the wall. *(Fig. P.2.4)* Wardrobe doors had large horizontal or vertical incisions into which a hand could easily slide,

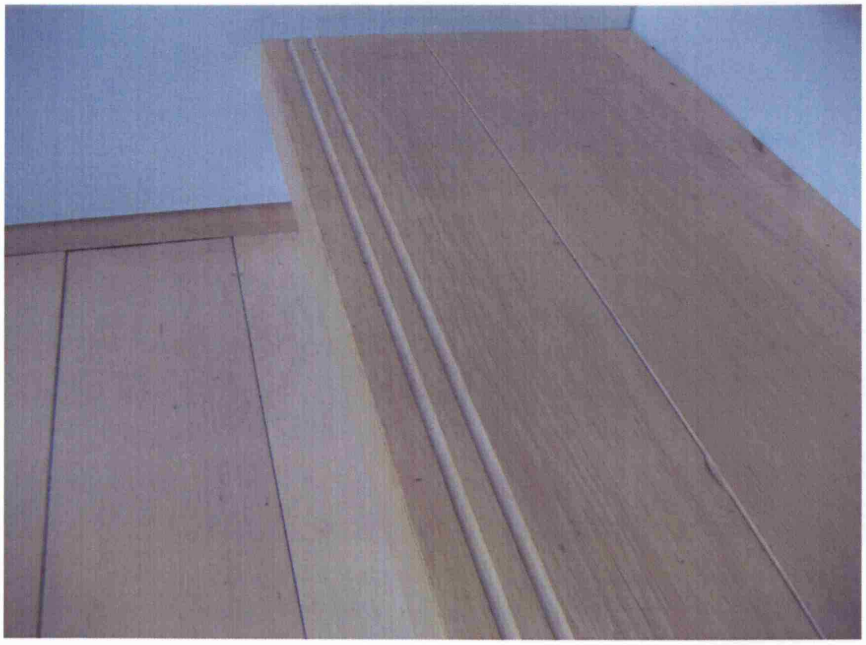

Fig. P.2.1. Ivana Wingham, *Homely Rhythms – stair lines detail*, photograph, London, 2004-2005.

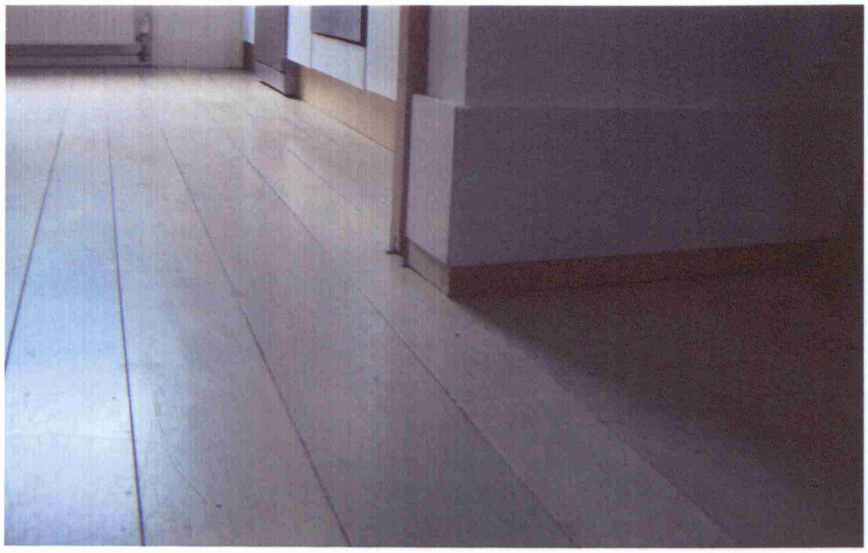

Fig. P.2.2. Ivana Wingham, *Homely Rhythms – floor lines detail*, photograph, London, 2004-2005.

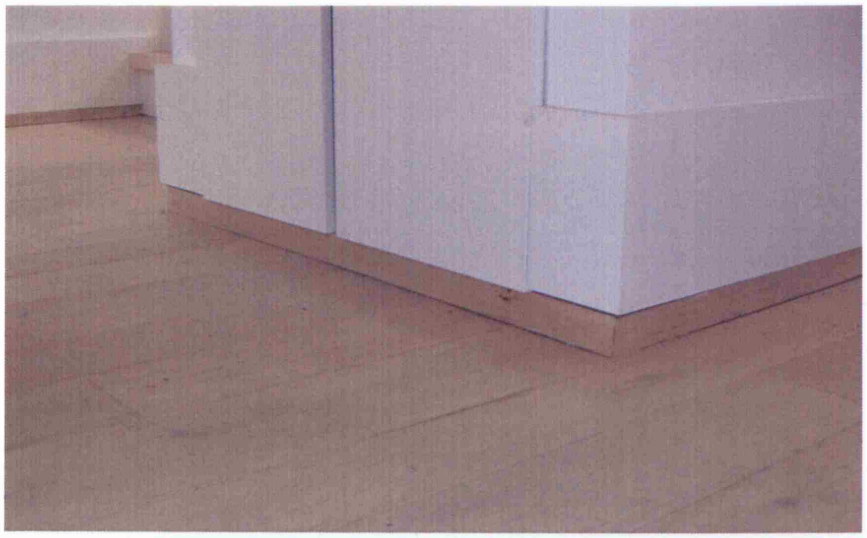

Fig. P.2.3. Ivana Wingham, *Homely Rhythms – floor/wall detail*, photograph, London, 2004-2005.

Fig. P.2.4. Ivana Wingham, *Homely Rhythms – sliding door detail*, photograph, London, 2004-2005..

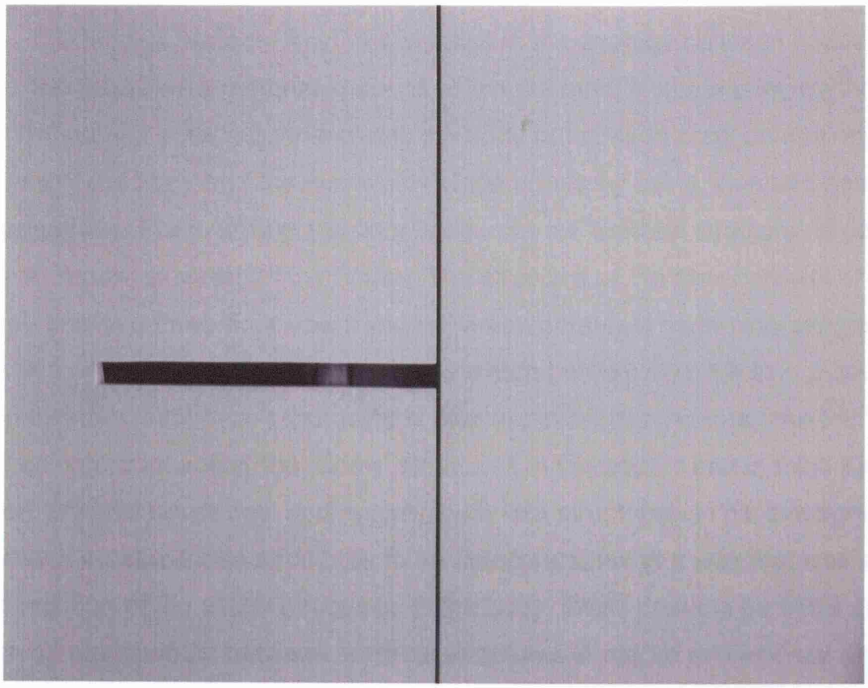

Fig. P.2.5. Ivana Wingham, *Homely Rhythms – wardrobe detail*, photograph, London, 2004-2005.

and an intimate encounter with one's clothes could be established even before seeing them. *(Fig. P.2.5)* The chest of drawers had a similar handle-gap; each drawer could be opened by inserting the hand or sliding the fingers into the gap. *(Fig. P.2.6)* The vertical surfaces continued the uninterrupted flow of the floor blending with walls and ceilings.

The idea of 'Homely Rhythms' resides in the analogy between house and body. It regards the house as a material space in which the most intimate body rhythms could take place. The project does not try to mimic the body but aims to draw an analogy between the structures of the body and the materiality of the house by using lines and deploying the material line's properties. For example, the floor is seen as an 'artificial structure', a continuation of the body-like, 'sinew' skeleton of the house. The structure of the floor consists of rhythmically repeated one-two-three floor-board widths, which creates a rhythmical progression that is an expression of function of the floor – a place where homely rhythms take place. The floor-lines created by such rhythmical progressions also appear interconnected like the 'chained structures' interconnecting the 'sinew' structures in the body. I had in mind Klee's analogy between 'artificial structures' and natural, body-like structures. In his example of his 'chained' structures Klee saw these structures to be interconnected in a way that was similar to the interconnection of the sinew structures in the body. While drawing parallels and creating analogical relationships between material structures in nature and artificial structures, Klee also used particular verbs to describe the functionality and operative energy of artificial structures. For Klee 'to build', 'to join' and 'to plait' are words that describe the making of artificial structures where 'the rhythm of the hand-movement' is evident.[14]

Apart from the rhythm of hand-movement present in the deliberately unequal distribution of the widths of the floorboards, the movement of the floor-lines also suggests a 'movement of measure' where the floor-surface can be seen as 'broadening-narrowing, expansion, contraction', all attributes that Klee saw to be attributes of a living organism.[15] The edges of the floor encountering the walls are considered to be 'joins' or a 'pleats' in Klee's terms, where two materials weave and connect to each other in a way that allows the individuality of both to remain present and visible. The junction of the supporting handrail, which 'strikes' and 'breaks through' the surface of the stair edge is another place which demonstrates how two different materials can connect in a particular joint, in a way similar to the muscle and bone relationship described by Klee.

The house then is understood as a painting canvas or drawing board where the lines have particular functions similar to those Klee recognized in the functions of sinew, bone or muscle structures of the body. For Klee, the line's materiality was evident in its functional roles, which consisted of contacts between adjoining fields of structures, areas and materials.

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[14] Paul Klee, text from original drawings and notes from *Instruction Lessons by Paul Klee 9 [Unterricht Paul Klee]* on *Formations and Theory of Form [Gestaltungs und Formlelere], 1930*, (transl.) Kathrin Hassold (photo.) author, November 2005, (Berlin: Bauhaus ARCHIVE, Inv. Nr. 10365/33 - 58), p. 54.
[15] Klee , 'Structural formation', p.220.

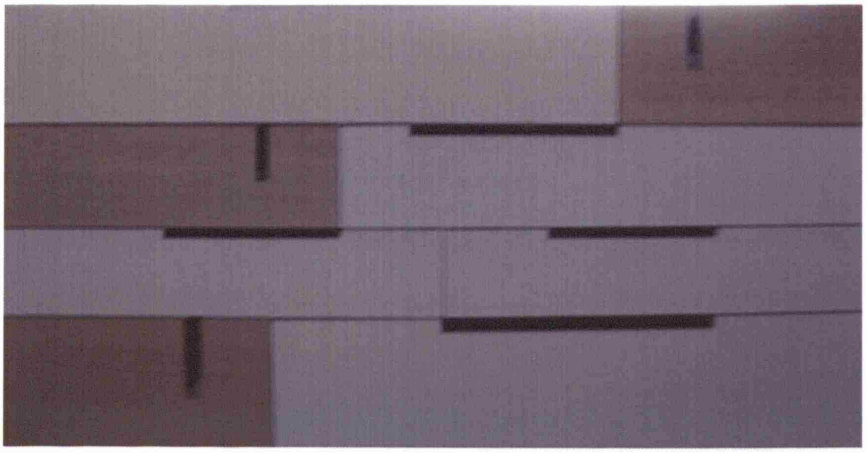

Fig. P.2.6. Ivana Wingham, *Homely Rhythms – front of the chest of drawers*, photograph, London, 2004-2005.

FIG.6.14

The floor, a unifying structure of the house, is here seen as a place for 'real spatial experience', that, in Moholy-Nagy's words, 'rests on [the] simultaneous interpenetration of inside and outside, above and beneath, on the communication of in and out, on the often invisible play of forces present in the materials and their relationships in space'.[16]

[16] Moholy-Nagy, *The New Vision*, p. 62.

**PROJECT 3: AN INTERMEDIATE PROJECT: 'LINES – NOTES'**

For a while I was fascinated with the problem of creating a link between the written and the drawn line. I did not wish to write text rather than draw lines but for the drawn line to acquire the property of a written line or a text. With this in mind, I wondered whether the traditional perspectival drawing was perhaps the biggest text of all, since it actually describes a space, as a text does an event or a scene. However, my own interest was not in a particular event or scene as such, but in the repetitive motion of actions that happen in a space. With this in mind, I set out to discover how a drawn line could be a written line.

First I tried to locate a common ground between the written line and the drawn line. Text does and drawn lines can occupy paper in a horizontal manner. Just as a text describes an idea in a paragraph, changes in the density or the colour of lines in a picture can also describe a particular action. I was intrigued by a desire to draw a line that was as similar as possible to writing. So, my starting point was the exploration of properties shared by written and drawn lines.

I made a series of drawings while thinking about the property of such lines. These drawings, as I was making them, started to acquire in my mind the status of scribbled thoughts. In these series of drawings I was writing lines rather than drawing them. I was trying to make a drawing of lines that took on the role of a paragraph in which a sequence of written thoughts clarifies aspects of an idea. This intuitive process clarified those aspects of the line that I was interested in, and these drawings became for me notes for ideas.

Another aspect of the project that was very important to me was the way in which the line was executed in such drawings. With this in mind, I felt that in order to think more clearly about the role of the line in architecture and other spatial practices I needed to explore different techniques. I tried to use brush and ink not only as tools of execution of lines but also as tools of discovery. While drawing, I aimed to discover the possibilities and limitations of techniques and found that a line's property could only be discovered through particular ways of working with the chosen tools. The notes-lines, as I called them, were experiments in, for example, the density of colour, the steadiness of a brushstroke, the thickness of a line, and the rhythmical repetition of lines.

The focus of my exploration was the world of objects that surround me and that I use on an everyday basis. These objects were seen as architecture on a small scale, challenging the preconception of architecture held by many, which considers only objects on a large scale and once completed. My attempt was to see if small everyday objects could extend beyond their physical boundaries through drawing. This is not a new idea – it is one that many architects employ – to explore what architecture can do as opposed to what architecture is. Focusing on the movement between objects, I considered the transitory nature of the space contained by

both architecture and the objects within it. A movement itself started to shape the drawings. As a result, as I was looking at the creation of different spatial relationships the outlines of the observed objects started to change, extend and depart from their original shapes.

The first drawings were attempts at trying to expand objects through traces of their movement. For example, repetitive lines tracing the movements of a chair or an ashtray many times during the day. *(Fig. P.3.1)* As the exploration of movement around the house took place, involving moving and observing the objects and recording my own actions through my line, the drawings themselves started to change. For example, I opened doors and cupboards and traced these movements of line and surface. *(Fig. P.3.2)* In the process of making lines of my own movement through the house I also realised that the places where most of the action happens are places around objects. The locations of tables and chairs are typical examples. This discovery gave me the idea that the place of intense action could be clearly distinguished horizontally in a drawing. Such a drawing could be produced as a single line between the place of the intensive action and the place outside of the action. *(Fig. P.3.3)* In another set of drawings I tried to see if the duration of the actions around the objects could be depicted as a field rather than as a line. The result was differently coloured strips that travelled across the objects of use, where in some way the idea of duration was represented by the repetitive strips of colour having certain differences in tone. *(Figs P.3.4, P.3.5)*

My experiments had a certain similarity with Klee's own drawing methods. Like Klee, I was interested in drawing that would displace a singular viewpoint in favour of multiple viewpoints that happen through movement of the body of the observer in space or movement of objects in space. Klee's abstraction of the phenomenological constraints of the body in space described his 'subjective theory of space' where the eye adopts a wandering rather than static viewpoint.[17] In his paintings Klee worked with what he called 'combined operations', in which there is a 'multi-dimensional simultaneity of projections'.[18] In order to achieve a 'shifting viewpoint' in the picture, Klee suggested 'contrasting viewpoints due to movement of the spectator', 'change in the relation between height', and, 'alternation of downward and upward'[19] views. For Klee such 'combined operations' produced 'projections [that] are in different positions, deviating from pure central perspective'.[20] Klee suggested that in order to achieve a unity and harmony in painting with these strategies the first step is to produce 'a regular deviation based on projection', where projection should explore mobile viewpoints, thinking that the 'viewpoint is not strictly static' but 'is displaced' and the 'objects move along'. [21] *(Fig. P.3.5)*

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[17] Klee, 'The horizontal', pp. 141-2.
[18] Klee, 'The horizontal', pp. 141-2.
[19] Klee, 'The horizontal', p. 142.
[20] Klee, 'The horizontal', pp. 141-2.
[21] Paul Klee, 'Synthesis of spatio-plastic representation and movement', *Paul Klee Notebooks, Volume 1, The Thinking Eye*, Jurg Spiller (ed.), Ralph Manhaim (trans.), (London: Lund Humphries; New York: George Wittenborn, 1961), p. 153.

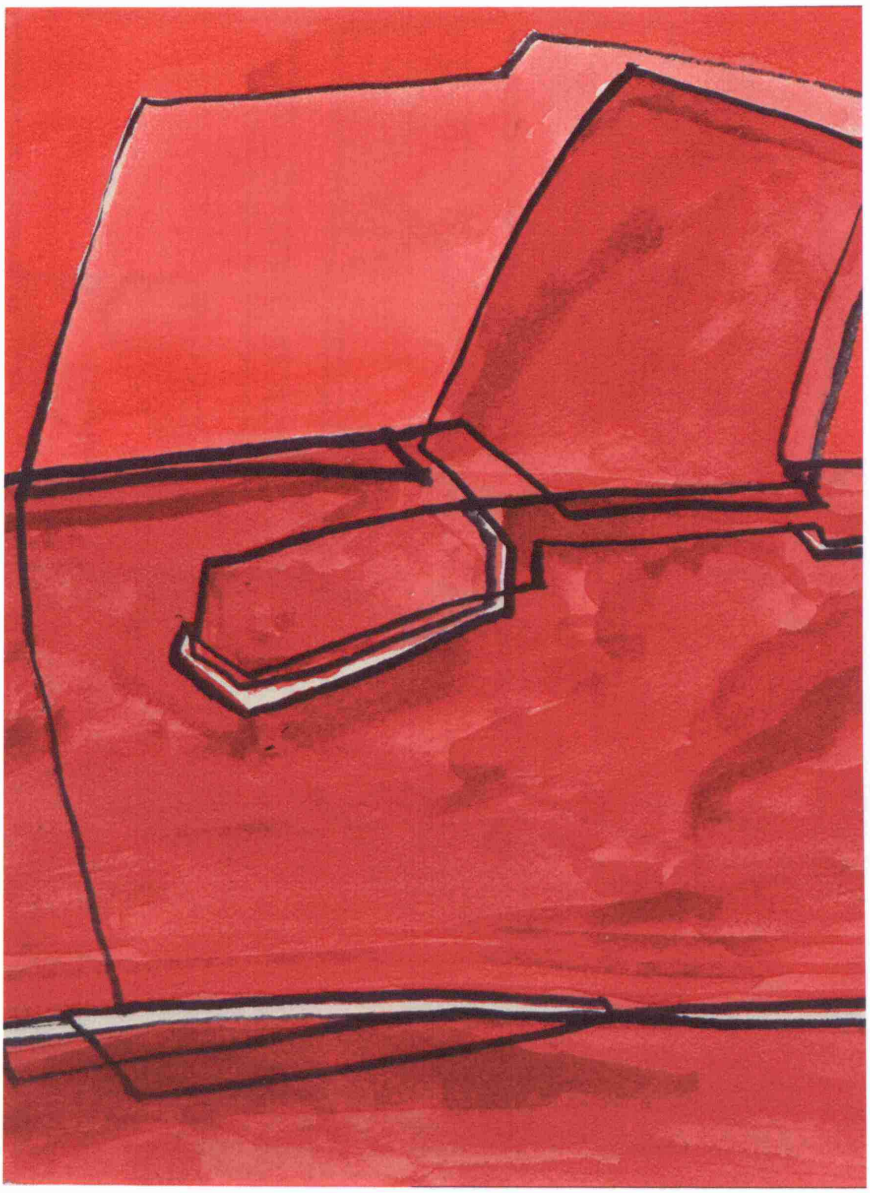

Fig. P.3.1. Ivana Wingham, *Lines–Notes*, photograph of a drawing, brush with ink on paper, London, 2003-2004.

Fig. P.3.2. Ivana Wingham, *Lines–Notes*, photograph of a drawing, brush with ink on paper, London, 2003-2004.

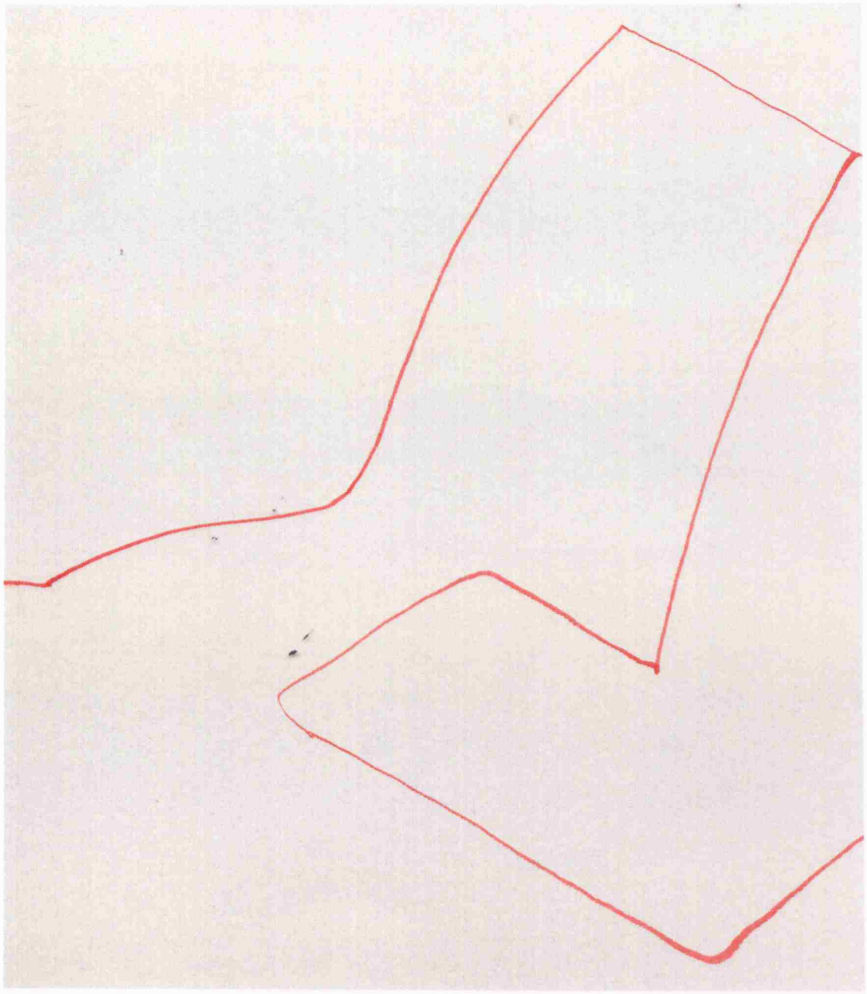

Fig. P.3.3. Ivana Wingham, *Lines–Notes*, photograph of a drawing, brush with ink on paper, London, 2003-2004.

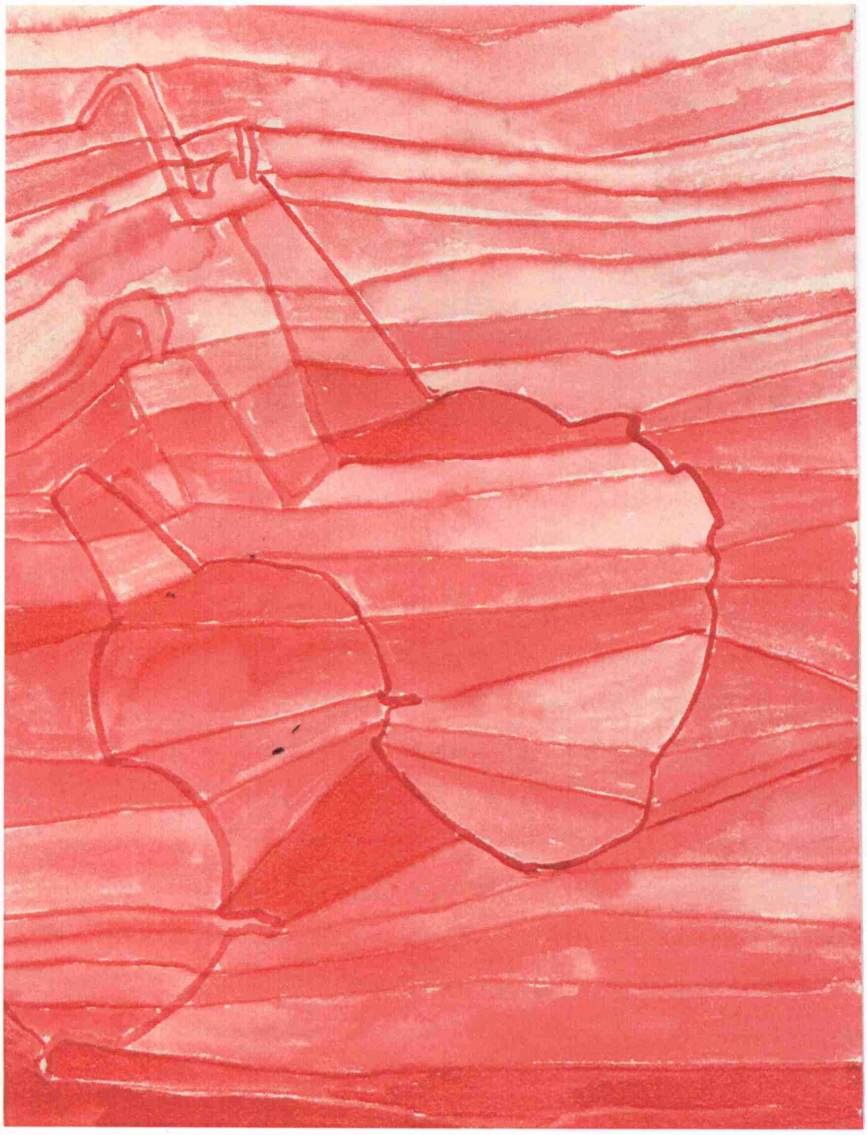

Fig. P.3.4. Ivana Wingham, *Lines–Notes*, photograph of a drawing, brush with ink on paper, London, 2003-2004.

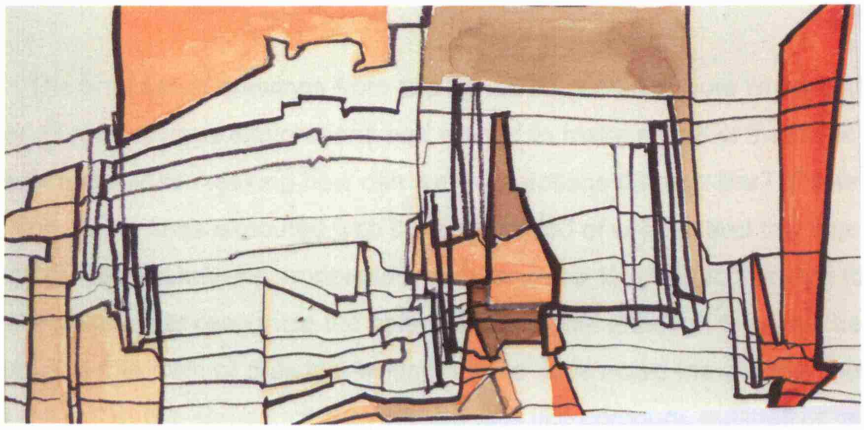

Fig. P.3.5. Ivana Wingham, *Lines–Notes*, photograph of a drawing, brush with ink on paper, London, 2003-2004.

Another step could be that 'we can also remain stationary and displace the object' [22]. Like Klee I experimented by moving my own viewpoint and position of the body in relation to the object in terms of height – upward, downward, and left and right views. My objects were moving along too and so I traced the shifting positions of these objects simultaneously through the lines that I was drawing.

The final set of drawings from this series consisted of pure line drawings, which brought together all my previous explorations and started to make sense of the ideas that I was trying to explore through lines – asking how can we write actions through line? These drawings were, in my opinion, lines, lines executed with the slow speed of writing, and this time I kept the precision of the brushstroke, horizontally from one row to another, from left to right, like writing. It was still possible to recognize the contours of objects although they had become more ambiguous in this form of drawing–writing. These lines noted the objects, movements and times around me but at the same time they looked less like contours, outlines or representations and more like waves in which the outlines of the initial objects could be recognized at points where the lines intensified. *(Figs P.3.6, P.3.7)*

What became apparent in the final drawings of the series was that I could no longer locate the object in one single place. The object(s) moved along the drawn lines. The actions that repetitively took place in relation to the object(s) had transformed them into something else, almost recognizable but also suggesting something else altogether. The lines had transformed the object(s) into a temporal narrative, one that moved from line to line as in a paragraph, one that made sense only by 'reading it' through, where one not only describes what is already there but also what may 'become'. These lines of 'writing' expressed the temporality of movement both through the way they were executed but also through the way they could, more like a text than a picture or image, be read. The reading process consisted of locating the object yet also extending it beyond its limits and therefore deforming it in the beholder's eye. In this sense the lines acted like the written notes of an 'unfinished' idea and as such opened opportunities for other writing-drawing processes to emerge.

In these final drawings I discovered the temporal flow and openness of lines and their resistance to completion. As a result I was able to move on to an exploration of another idea both through research and practice. My notebook full of 'scribbled notes' could be read only by me and opened up a potential for other work to come. The note-like quality of these lines was what I was after. Their ambiguity and lack of fixity was what I had been trying to discover. The visual presence of these lines was evidence of thought that was not yet fully developed. Their role was like that of the architectural diagram and its relation to an unfinished project, making a passage between the material and immaterial nature of the objects and things that surround us. The role of these lines was intermediary and provided a bridge between theory and practice.

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[22] Klee, 'Synthesis', p. 153.

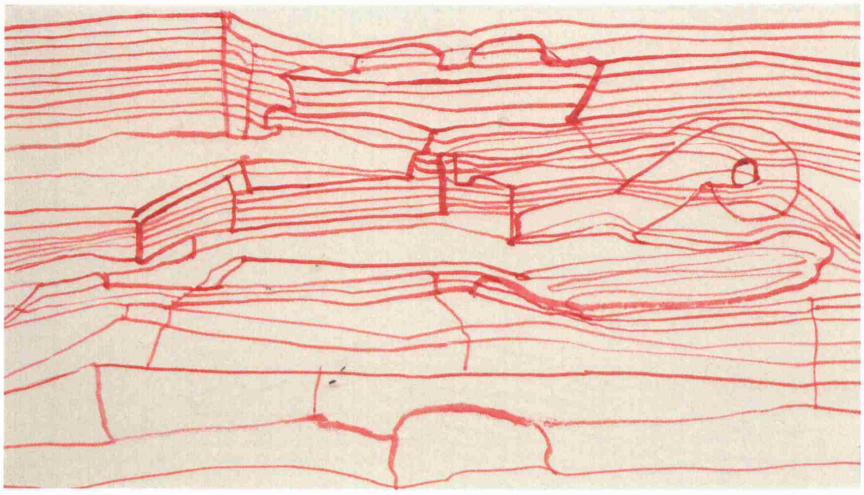

Fig. P.3.6. Ivana Wingham, *Lines–Notes*, photograph of a drawing, brush with ink on paper, London, 2003-2004.

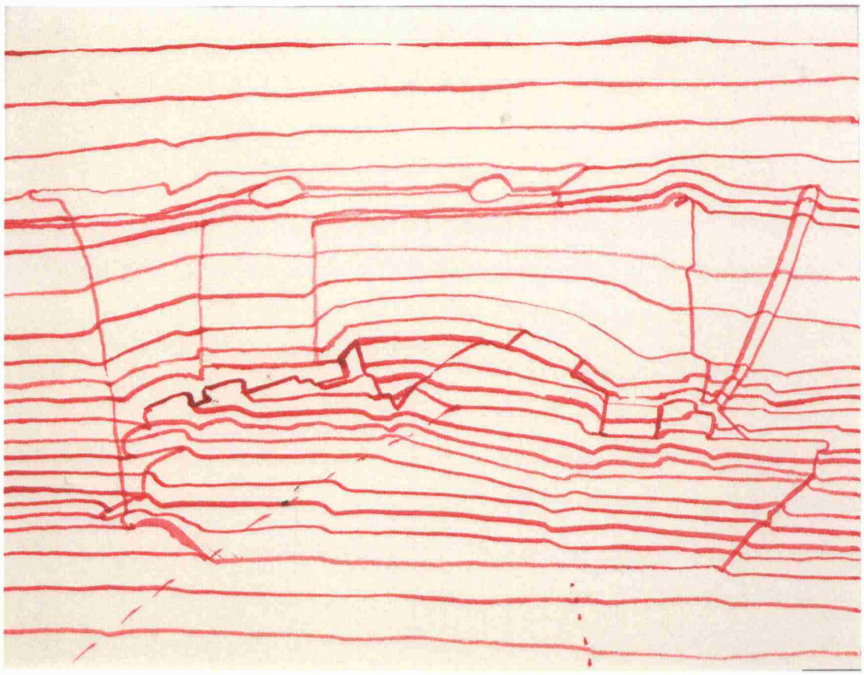

Fig. P.3.7. Ivana Wingham, *Lines–Notes*, photograph of a drawing, brush with ink on paper, London, 2003-2004.

Their purpose was not to define but to describe, not to fix but to open. They produced paths between previous ideas and projects, and projects and ideas that were yet to come.

**PROJECT 4: 'LINE ... TAKE ME FOR A WALK'**

In 2004, the UCL Graduate School launched a competition to design a backdrop for its graduation ceremony. The brief asked for an innovative design for a back-stage screen to replace the traditional curtain. In addition, the competition asked for an image to be projected on to the screen during the graduation ceremony. My entry was awarded first prize and a small budget was allocated to realize its execution.

My initial idea aimed to consider how the relationship between the auditorium, stage and back-of-stage could be altered by the design of the screen. I started thinking about the theatre, where the stage is a place of performance and the back-of-stage including the support system and machinery allows this performance to take place. In classical theatre, the set-up of the stage does not allow the audience to see through the screen and view the support system of props that support the front performance. The screen is positioned in such a way that it highlights the boundary between the two. However, the contemporary world is increasingly concerned with revealing the machinery behind the performance. I started then to think that the relationship between the performance and the mechanisms supporting the performance should be made more visible and that the relationship between the stage and back-of-stage, and its relationship to the audience, could be thought of in a different way. In addition, I thought that the kind of view that one should get of 'behind the screens' should be quite deliberate in its aim to emphasize a public figure's closeness to the public. To see 'behind the screens' alters our sense of vision by introducing a flaw in the otherwise perfectly choreographed visibility of a public figure and his or her performance in the world. Sometimes this flaw of a public figure's role may be revealing, while at other times it may make the performance more obscure. In the context of an educational environment and for the purpose of a graduation ceremony, I wished to focus on the moment of graduation as a construction – as providing a transitional moment moving the student from the university into a public performance in the wider world.

With these ideas in mind I started to design the screen in such a way that it introduced a porous space between the stage and the back-of-stage. To achieve this, the screen onto which the image was to be projected needed to be broken into several elements. I chose seven elements – four elements that were of the same size and shape and three other elements that were slightly different in size and shape. These elements were geometrically cut out of a single surface, but designed in a successive manner so that every other shape was repeated. Each element was not positioned perpendicular to the ground surface but rather created a small angle over the four meters of height of each element. When positioned in a row a narrow wedge between each element was opened, narrower at the bottom and wider towards the top. *(Fig. P.4.1)* Each element had wheels to achieve mobility, so that one person could easily move it into any position desired. Each element was made from two steel frame parts and the top part folded into the bottom part for storage. *(Fig. P.4.2)* On each element there were three white-

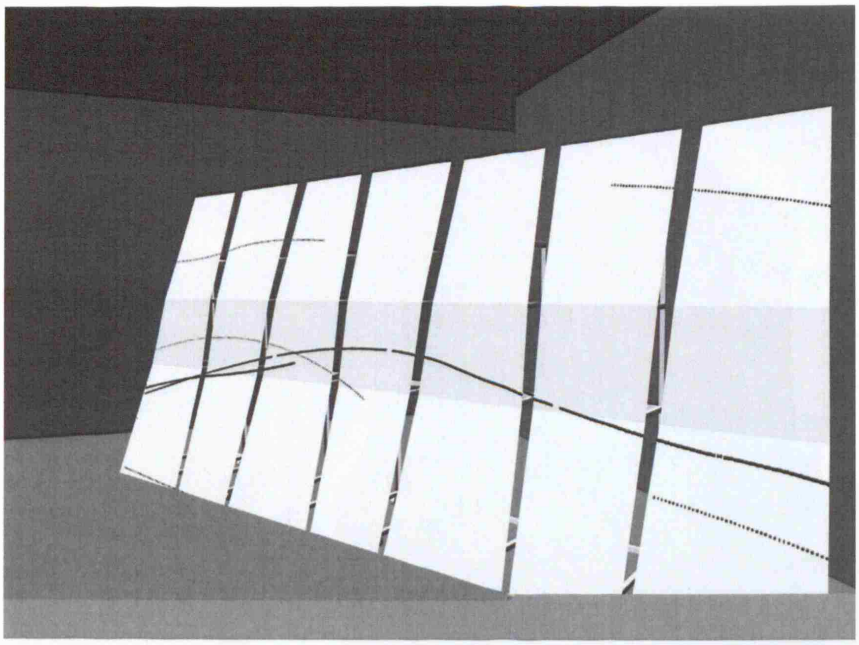

Fig. P.4.1. Ivana Wingham, *Line… Take me for a walk*, digital image of the stage, London, 2003-2004.

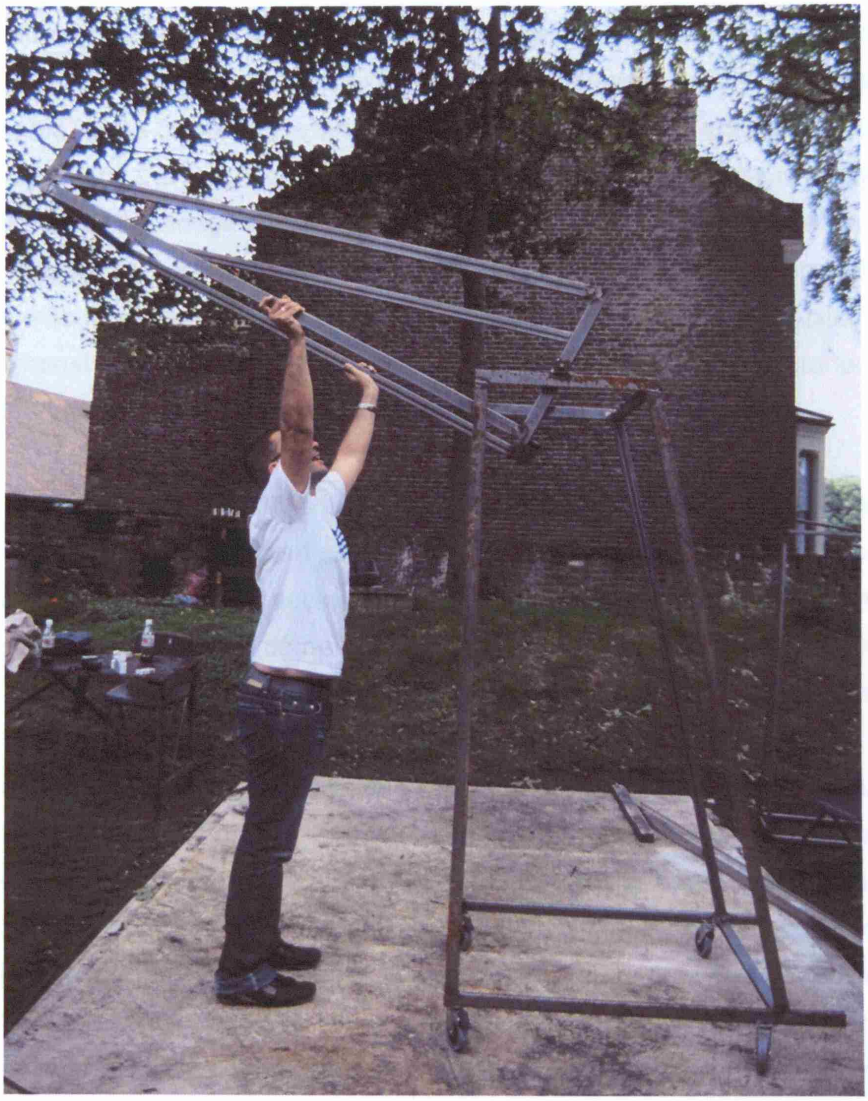

Fig. P.4.2. Ivana Wingham, *Line… Take me for a walk*, the folding of the stage screen, London, 2003-2004.

painted MDF panels, which were hung like pictures, slightly overlapping, and creating a small, but visible, surface change. *(Fig. P.4.3)*

By breaking the unity of the screen into elements, and creating the elements as cut-outs from a single surface as well as by manipulating the angles of each element to be slightly off the perpendicular to the floor surface the gaps between each element became visible. This design strategy created a sense of porosity between the back-of-stage and front-of-stage. *(Fig. P.4.4)* These small gaps between the individual elements allowed the spectator a glimpse of what was going on behind the screens. When an image was projected onto these screens, the unified appearance of the image was broken and it appeared slightly fragmented, with a very small part of the image lost in the dark space between each element. This breaking of the background screen onto which an image was projected created a particular fragmentation in the comprehension of the unified image for the audience, which, in turn, distorted the classical boundary between the front and the back of stage.

The breaking up of this background surface worked in a similar way to Moholy-Nagy's ideas for making a background surface that 'becomes a part of the atmosphere, of the atmospheric background; it sucks up light phenomena produced outside itself – a vivid contrast to the classical conception of the picture, the illusion of an open window'.[23] Also, like Moholy-Nagy, I saw that a different conception of the background surface, which could be transformed using various light displays or projections, would produce different effects for the same stage organisation. Moholy-Nagy's suggestion was that the rectangular screen was inadequate, and limited 'our conception of space' which remained 'restricted to the everyday phenomenon of light rays entering a room through an aperture in one of its walls'.[24] Moholy-Nagy attempted to 'break-up' the background screen by using multiple projections and introducing different shapes of projection screen.[25] In addition he suggested that 'more than one film [...] would be played on this projection screen; and they would not [...] be projected on to a fixed spot but would range continually from left to right or from right to left, up and down, down and up, etc.'.[26] Moholy-Nagy was seeking an enriched spatial experience, where 'two or more events which start independently of one another but will later by calculation combine and present parallel and coinciding episodes'.[27] For Moholy-Nagy, such projection screens had the advantage over traditional ones in 'representing a process of movement [...] with greater illusion' rather 'than the present projection screen on which one image must always be fixed'.[28]

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[23] Laszlo Moholy-Nagy, *The New Vision and Abstract of an Artist*, (1928, New York: Wittenborn, the fourth revised edition, 1947), p. 39.
[24] Laszlo Moholy-Nagy, '"Projection" in 'Problems of the Modern Film', Richard Kostelanetz (ed.) F. D. Klingender and P. Morton Shand (trans.), *Moholy-Nagy: an anthology*, [written 1928-30 and originally published in *Cahiers d'Art*, VII/6-7 (Paris, 1932)], (New York: A da Capo Press, 1970), p. 137.
[25] Laszlo Moholy-Nagy, 'Simultaneous or poly-cinema', *Painting, Photography, Film*, [original published in 1925 in *Bauhausbucher 8* as *Malerai, Fotografie, Film*], (Cambridge, Massachussets: The MIT Press, second printing 1987), p. 41.
[26] Moholy-Nagy, *Painting, Photography, Film*, p. 41.
[27] Moholy-Nagy, *Painting, Photography, Film*, p. 41.
[28] Moholy-Nagy, *Painting, Photography, Film*, p. 41.

Fig. P.4.3. Ivana Wingham, *Line… Take me for a walk*, mounting of the screen panels on stage, London, 2003-2004.

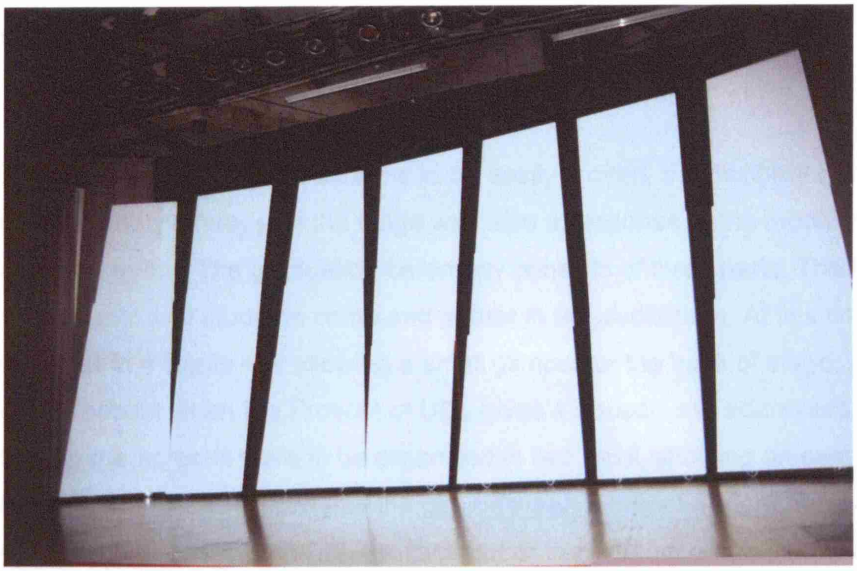

Fig. P.4.4. Ivana Wingham, *Line… Take me for a walk*, the stage with all screens in position, London, 2003-2004.

Inspired by Moholy-Nagy's ideas of breaking the background surface and producing mobile projections I tried to make my project an example of such mobility. The seven elements that made up the screen could assume different positions on the stage depending how the stage was organised. For example, the screens could be organised in a single row, or as two rows, in which the four similar screens could create one row and three similar screens could create another row, with one row placed in front of the other. Another option was to organise the screens as a semi–circle, or even to disperse them.

Apart from allowing the screens to be easily moved, the flexibility of re-organising the screens in a variety of ways on the stage was also a response to the mobility of the phases of the graduation event. The graduation ceremony consists of three parts. The first part occurs when the parents and students come and gather in the auditorium. At this time the screens were to be set in a single row allowing a small glimpse of the back of stage. *(Fig. P.4.5)* The second part occurs when the Provost of UCL gives a speech and addresses the audience. In this situation the screens were to be organised in two rows, showing an even larger view of the back-of-stage in order to emphasize the gap between the front performance of the public figure and the back-of-stage. *(Fig. P.4.6)* The last part of the graduation ceremony consists of the giving and receiving of degrees. At this point the elements were to be organised in a semi–circular way so that the ceremonial ritual of the giving of scrolls could take place in the centre of them.

The mobility of each individual screen allowed for the event on the stage to be understood as broken into parts rather than as a unified and continuous event with a static background. The mobility of the actions taking place on the stage paralleled the mobility of the actions in the wider world aiming to suggest the range of possible roles open to a graduate going into the world at large.

In addition to the design of the screen, the competition brief asked for the design for an image to be projected onto the screens during the ceremony. The image was to represent UCL in some way. I started to think that if the idea of the ceremony was to be seen as a three-part action in which the mobile screens assumed different positions in different parts of the ceremony, the image itself should follow this mobility. The only way that such a mobile image could be achieved was through animation and projection.

To follow the idea of a change of screens, the animated image was designed to respond to the three parts of the graduation event. The first stage of the animation consisted of a network of flowing and moving lines projected across the screens at certain moments followed by a particular well-known sentence on knowledge. *(Fig. P.4.7)* This stage of the animation was to take place in parallel with the public gathering before the ceremony, when the screens were positioned in a single row. The second stage of the animation was activated at the moment the Provost appeared on stage. At this point the flowing mobile lines started to break into straight

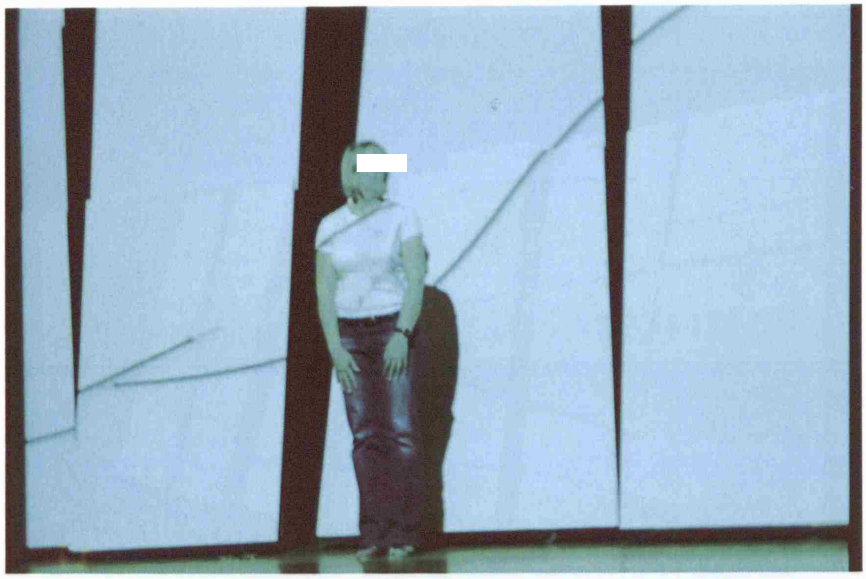

Fig. P.4.5. Ivana Wingham, *Line… Take me for a walk*, test projection on the stage, London, 2003-2004.

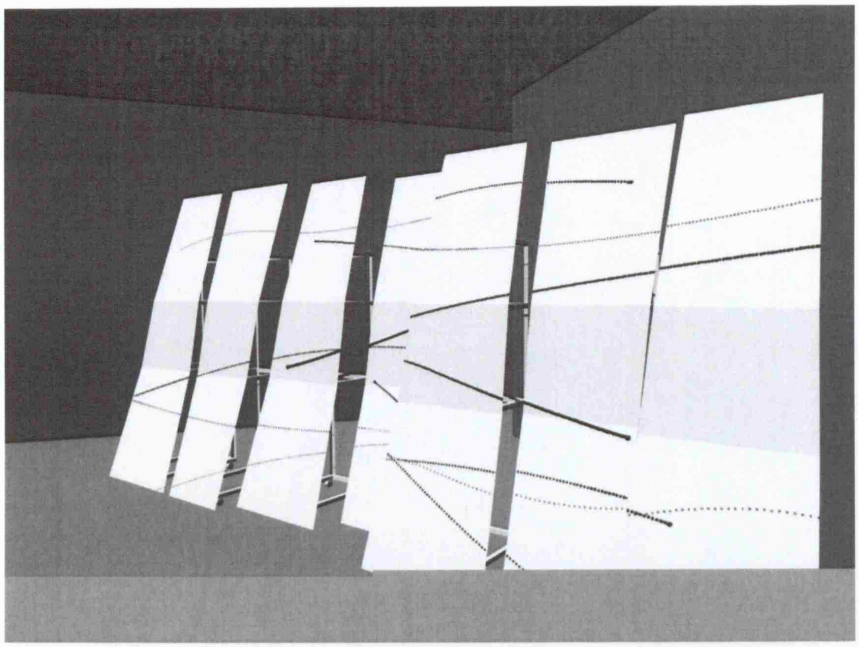

Fig. P.4.6. Ivana Wingham, *Line… Take me for a walk*, digital image of the stage, London, 2003-2004.

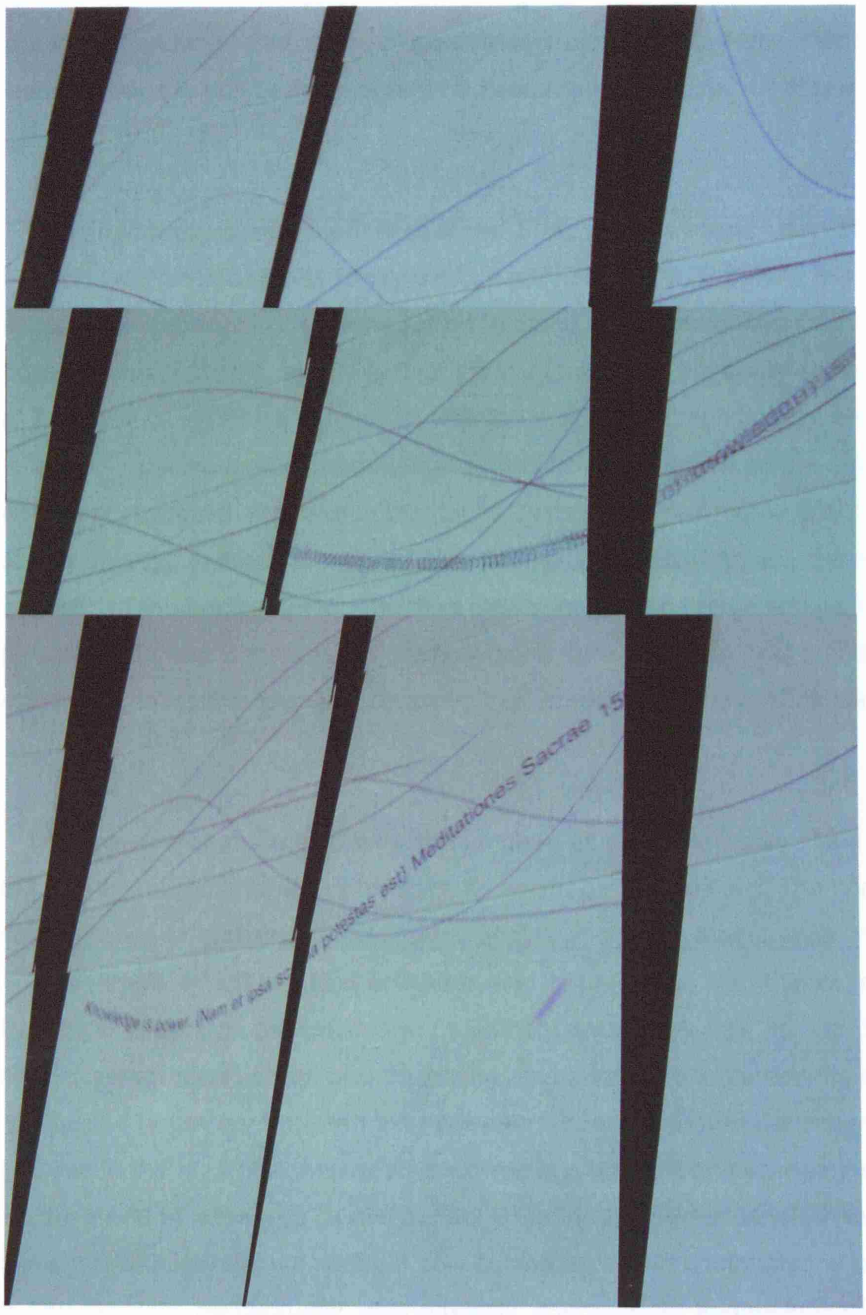


Fig. P.4.7. Ivana Wingham, *Line… Take me for a walk*, test projection (stage 1) on the stage, London, 2003-2004.

lines that became words of a text that created a static paragraph. *(Figs P.4.8, P.4.9)* This stage of animation coincided with the Provost's speech and also with the individual screens being positioned in two rows. The projected text, now static, aimed to produce associative lines of thought in the reader's imagination. In the final stage of the graduation, when the graduates received their degrees, the words in the text paragraph were turned back into drawn lines, and slowly created an outline of an image of graduates projected as a static image on the background screens which at this moment had acquired a position of a semi–circle. *(Figs P.4.10, P.4.11)*

This project explored a number of ideas. First, was the idea of disrupting the separation of the front and the back of the stage by using a porous screen. Breaking the background screen into seven elements or screens aimed to make a connection between the performance and its support mechanisms, and to extend view lines beyond the boundary of the background surface. The second idea was concerned with the mobility of the individual elements and their ability to reconfigure the space on the stage in relation to the action on the stage. This was informed by my interest in how action that takes place in the 'real' world is not static but continuously shifting, in flux and mobile. Both literally and metaphorically the elements 'moved' with the action of the performance. The third idea was that the image should follow this mobility too. Operating between animated and static images, between lines, text and drawing, the image itself was broken into parts and was re-configured according to the actions taking place on the stage.

The movement of the elements can be seen as cuts in the time of the event, while the projected and animated image can be seen as an image of time itself. The combination of the cuts and the image of time create different spatial relationships that co-exist materially and virtually. The image, which is a kind of matter, and its projection on, at times, moving elements of the background surface depicts image-movement and matter-flow as one. The project, by breaking the background screen and projecting animation onto the elements as fragments, aimed to blur the boundary between the projected visual image and the material of the screen. This is similar to the idea of a theatre where there is a connection between the front and back of stage, or the world at large and its microcosm – the theatre performance. I hoped that this project would create conditions wherein new connections and combinations could be drawn – socially, linguistically, perceptually, economically, conceptually and historically. In addition, the project aimed to dematerialize the screen, to fragment and project an animated image using a strategy that was inherently ephemeral and susceptible to multiple repetition and reproduction, drawing on performance, text, photography, video, site-specific installation.

Working between material and immaterial techniques offered different spatial relationships that challenged the relationship between matter and image. The project worked took the drawing and replaced it by a moving and animated line, a vector of a kind, in the real space of the performance and inverted the relationship between the author and the drawing. By

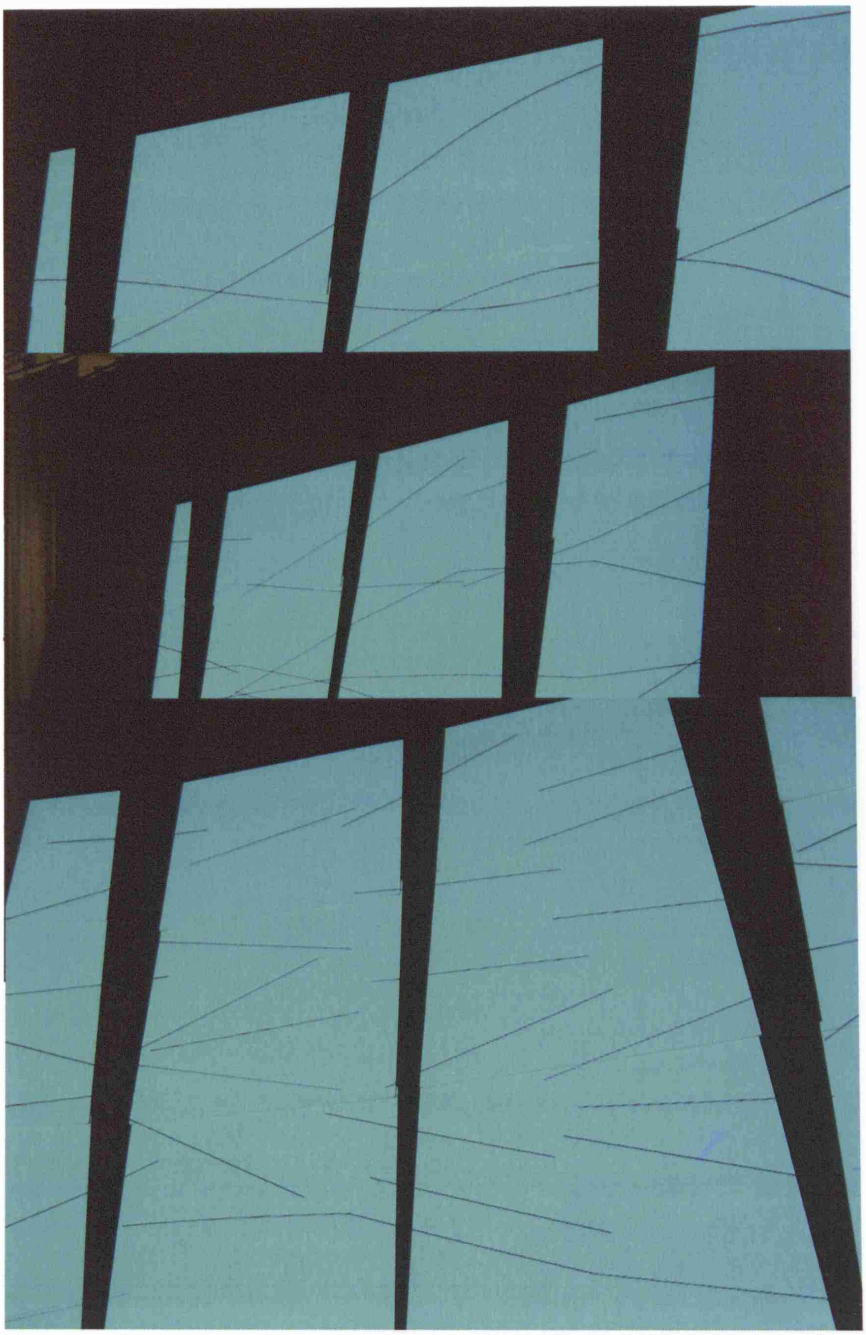

Fig. P.4.8. Ivana Wingham, *Line… Take me for a walk*, test projection (stage 1/2) on the stage, London, 2003-2004.

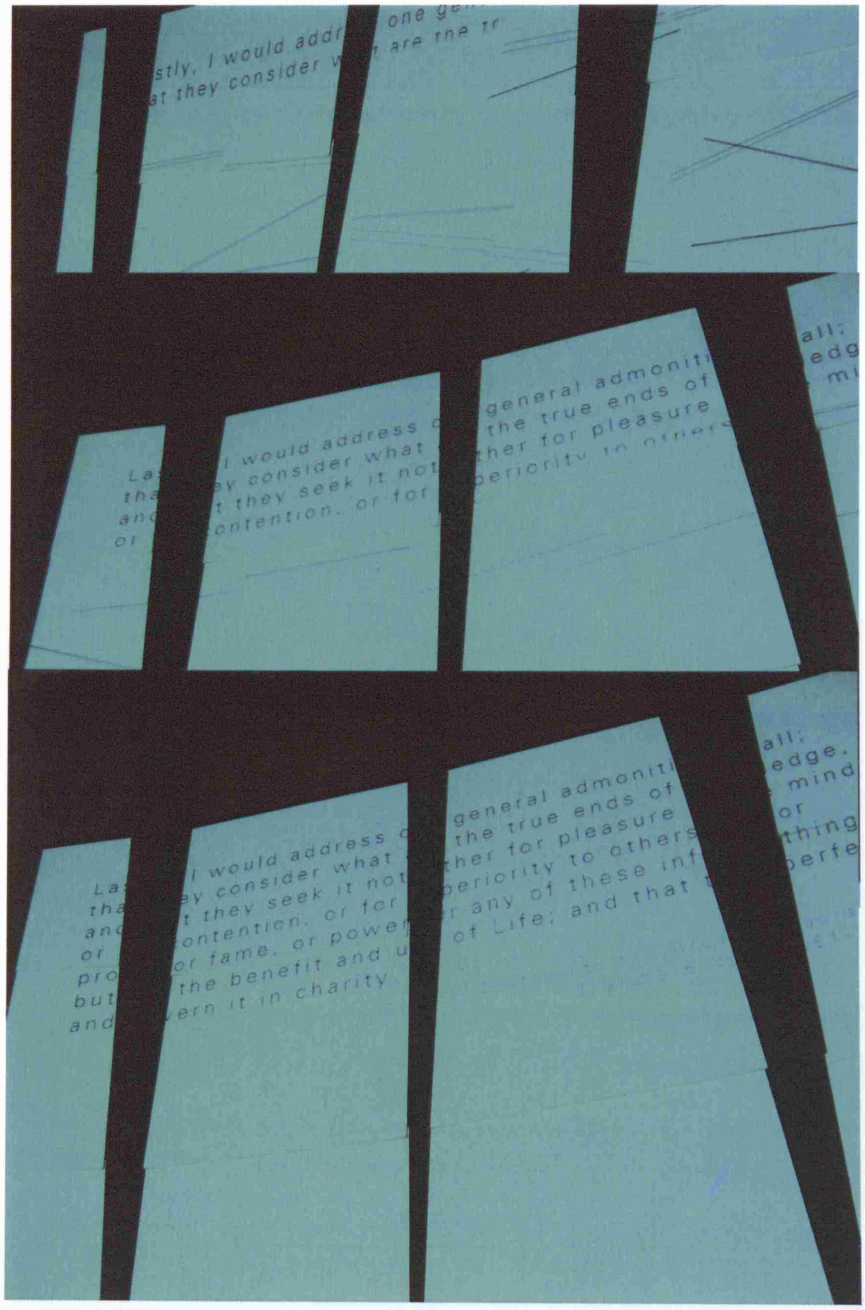

Fig. P.4.9. Ivana Wingham, *Line… Take me for a walk*, test projection (stage 2) on the stage, London, 2003-2004.

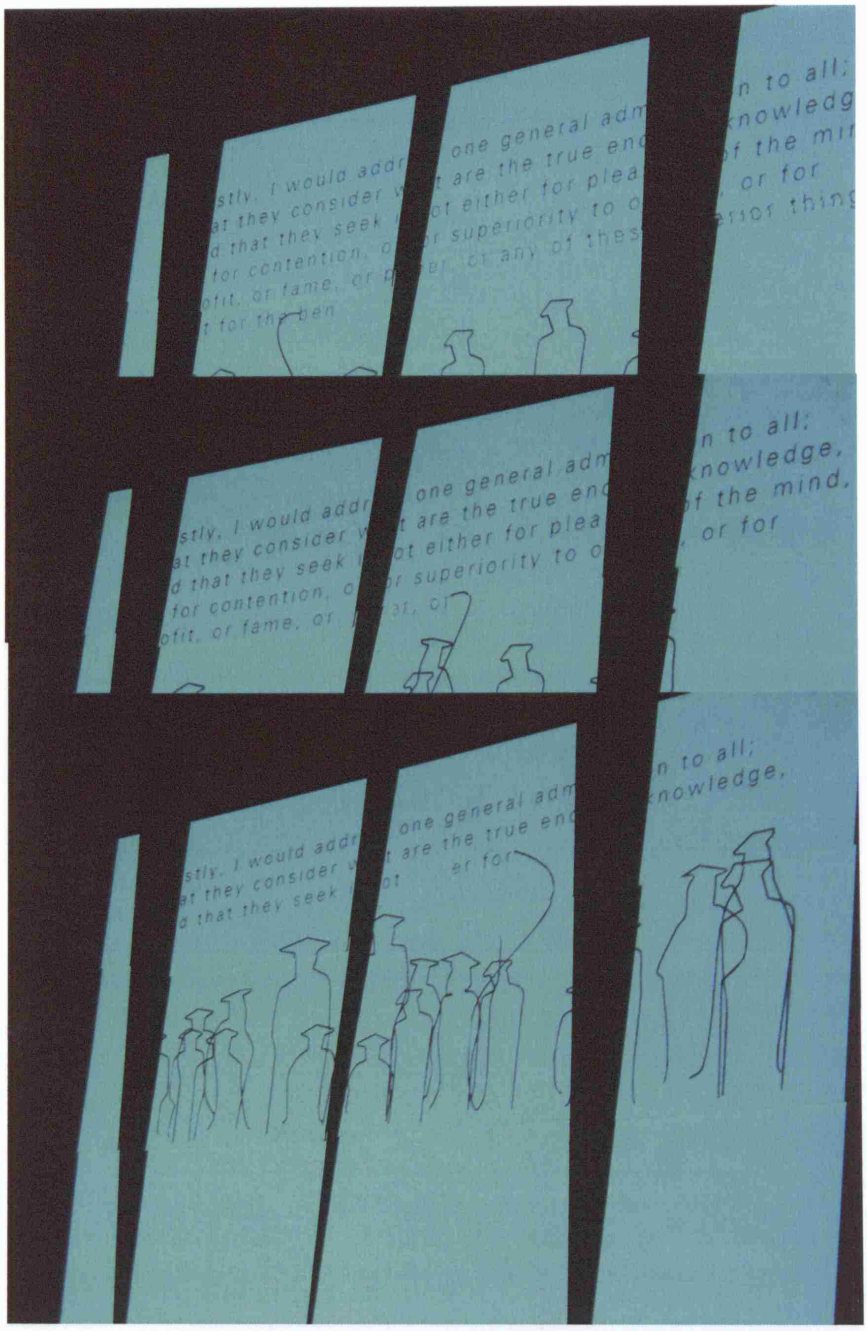

Fig. P.4.10. Ivana Wingham, *Line… Take me for a walk*, test projection (stage 2/3) on the stage, London, 2003-2004.

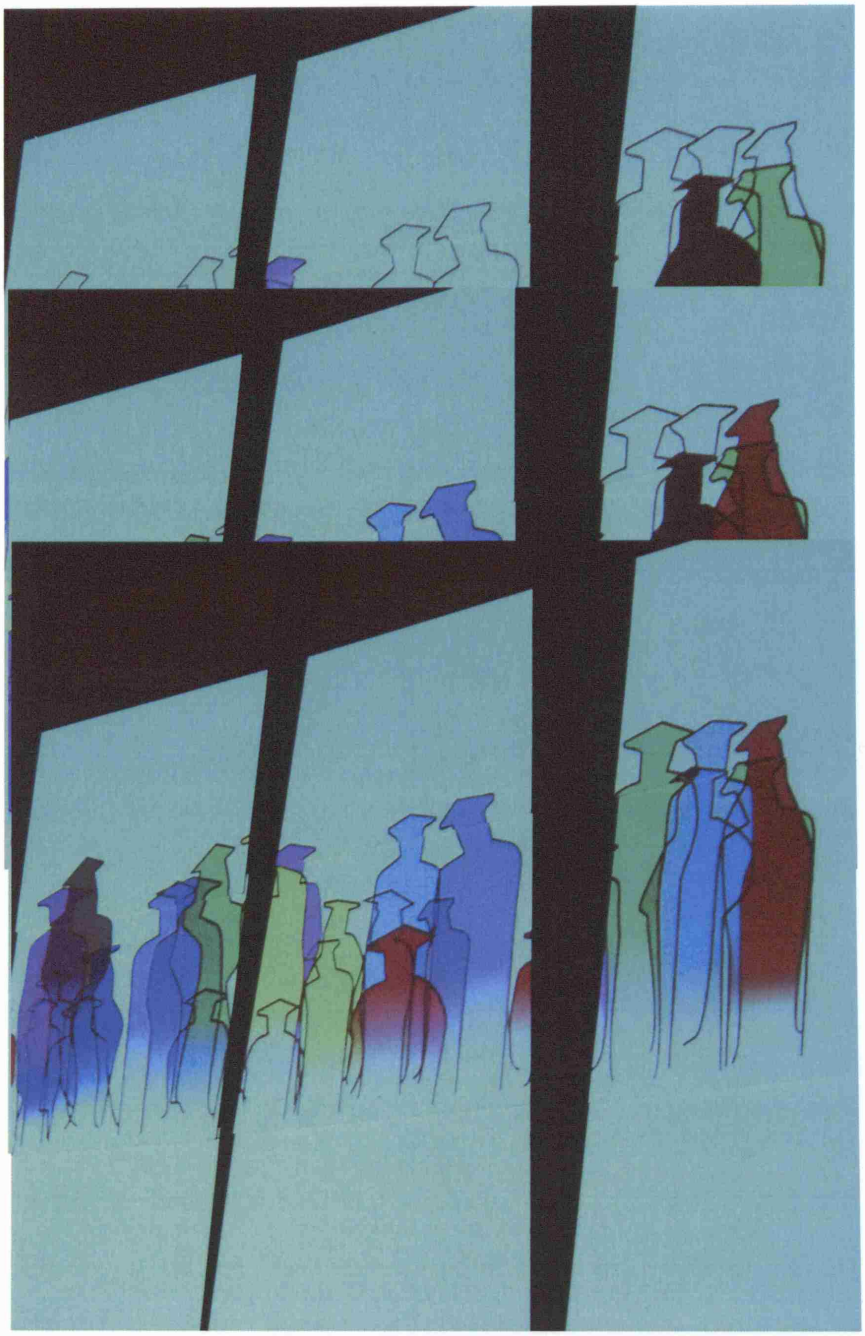

Fig. P.4.11. Ivana Wingham, *Line… Take me for a walk*, test projection (stage 3) on the stage, London, 2003-2004.

breaking up the screen into seven mobile elements and re-configuring the space in relation to particular actions, the project worked against the singularity of an object and instead recognised the multifaceted re-configuration of spatial relationships between elements, animated images and actions on the stage. In this way, we can almost say that the lines of such relationships as well as the lines of the animated images and texts, rather than being taken for a walk, started to take us for a walk. *(Fig. P.4.12)*

Fig. P.4.12. Ivana Wingham, *Line… Take me for a walk*, test projection on the stage viewed from the auditorium, London, 2003-2004.

## PROJECT 5: 'AN EPIGRAMMATIC CONVERSATION WITH KLEE ON LINE-ENDINGS – A GARDEN PROJECT'

> *No sooner have I mastered that stage than nature again bores me. Perspective makes me yawn. Should I now distort it (I have already tried distortions in a mechanical way)? How shall I most freely cast a bridge between inside and outside?* [29]

Thinking about how my research could consider the end of the line, I became interested in how a line might have an end while still suggest a movement. The line, when understood to be beyond a drawing, is particularly open to such possibilities. I was attracted by the notes Paul Klee kept in his diaries during his trips between 1898 and 1918 (*The Diaries of Paul Klee 1898-1918*) in which he used to write many epigrams that he called 'line-endings'.

In one example during his Italian trip (1902), Klee wrote what he called, 'Poems of an epigrammatic sort with these line-endings: Rhymed/glued/great pain/to be superfluous'.[30] In another similar example Klee wrote:

> *Epigrams:*
> *In God's place/shrill/own beauty/tones.*
> *Palette/save/never suited me/ old man's poesy/departs/disgusts/*
> *Bloom/green.*
> *Taken/come/paid/too thinly painted.*
> *Creates/strength/chose/souls/to be modest/small/*
> *Trace/nature.*
> *11.25/26.* [31]

Klee stated in his diaries that these lines 'were conceived during a clear nocturnal hour' and many such examples in his diaries are reflections written at night on the experiences of the day.[32] However, as well as being written at night, these epigrams have something else in common. They use words to depict an atmosphere or a vision. They combine what has happened during the day with something else that is starting to form in the artist's mind. I also found these epigrams interesting because Klee named them 'line-endings'. Klee, someone interested in 'taking a line for a walk' was also using the phrase 'line-endings'. Looking more closely at the words that Klee used in these epigrams, they appear to be words that depict an action or a situation that the artist experienced while thinking about the colour or shape of his new painting.

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[29] Klee, '831, Munich 1908', *The Diaries of Paul Klee 1898-1918*, ed. and with an introduction by Felix Klee, (Berkeley, Los Angeles, London: University of California Press, 1964) p. 228.
[30] Klee, '325, Italian Diary (October 1901 to May 1902)', *The Diaries of Paul Klee 1898-1918*, p. 77.
[31] Klee, '306, Italian Diary (October 1901 to May 1902)', *The Diaries of Paul Klee 1898-1918*, pp. 66-67.
[32] Klee, *Diaries*, pp. 66-7.

Knowing Klee's concern with the line and movement and his creative investigations in which he tried to use every possible strategy in painting to avoid a conclusion, I became intrigued by these epigrams on line-endings. Although Klee called them endings I thought of them as beginnings rather than closings. Each word he used either rhymed in the poem or conveyed a particular message to the reader, which did not seem to be about closure or conclusion but more concerned with how lines may be extended. For example words like 'creates', 'strength', 'chose', 'souls', 'to be modest', 'small' were, I felt after reading Klee's Diaries, suggestive of the movement of the hand, the force behind an image, the decision to draw a line, a recommendation for how to use colour, scale or size of the painted surface, as well as an emotional attachment.

Klee stated his boredom with learning from nature or from perspective and spent most of his life subverting the rules of the two in order to find a new, mobile way of painting. His ideas about the structures, functions and rhythms of the line originated from observing nature. His rules of progression, shifting viewpoints and the use of horizontals were concerned with deviations from the rules of perspective. Klee's search was for the middle, a point between two, a way to 'most freely cast a bridge between inside and outside'.[33]

With these ideas in mind, I started thinking about a particular epigram. It was an epigram that Klee wrote while in Italy entitled 'Epigram with line-endings: Curse/search/fetch/stolen/gained/jumped/one/appear/a bit of joy/burning eyes for the most/through envy/my son, you are insolent'.[34] What interested me about this particular epigram was that the words reminded me of parallels between experiences and creative techniques. I thought that a line could 'fetch', 'search', 'jump' or 'appear'. But I also thought that the words are similar to feelings that one has when there is 'a bit of joy' or a feeling of 'burning eyes' when something very exciting has been seen. The words that Klee used in his epigram were active words that were also visually associative. The idea of a project started to appear in my mind. The project that I was aiming for had to consider both of the aspects of Klee's epigram – the project had to be a visual exercise and to do with a line produced by words. My focus was on different ways in which words could create lines through visual techniques. I also started to think of Klee's incessant desire to capture movement and particularly his desire to 'cast the bridge between the inside and outside'.

I felt that his diagrams on the 'mediating line' were the most obvious tools through which he tried to depict movement between two fixed and well-known shapes. I also felt that his epigram on line-endings might provide the words to guide such lines. With these ideas in mind and the availability of computer programs where lines or shapes can be generated using words I tried to enter into a 'conversation' with Klee. This conversation consisted of taking words from

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[33] Klee, '831, Munich 1908', *The Diaries of Paul Klee 1898-1918*, p. 228.
[34] Klee, '316, Italian Diary (October 1901 to May 1902)', *The Diaries of Paul Klee 1898-1918*, p. 76.

Klee's epigram and using them as program instructions to generate mediating lines. The computer program used these words to produce a particular shape, repeat it at random, colour it and move it. These words were further translated into a mathematical function.

Using three particular shapes from my earlier research on the 'mediating line' (see Chapter 2) *(Figs P.5.1 – P.5.3)* I imagined what might happen if some of the words could be interpreted as an instruction for a shape to move and while moving change shape. Klee tried to explain such a movement by drawing different shapes by hand. No matter how many times he drew these shapes Klee was not able to predict every possible new shape that a mediating line could draw between two fixed shapes. However, this infinite number of shapes may be seen and captured by animation and visualized in seconds. For example, a circle inscribed into a square can move along the diagonal line of the square, generating new asymmetrical shapes depending how close to or far from the diagonal line the circle is positioned. *(Fig. P.5.4)* In the example of a moon-like shape inscribed in a square and moved along centralized rays in all directions, the shape can contract or expand depending on its distance from the centre while at the same time changing shape. *(Fig. P.5.5)* In another example this time using a diamond-like shape with splayed rather than straight edges inscribed in a square, two different shapes appear depending on whether the shape moves towards or away from the centre. *(Fig. P.5.6)*

What was particularly interesting about this project was the way in which the words could generate lines and capture shapes along paths of movement. Another fascinating aspect of the project was that the words that originated from Klee's own epigram became my own guiding titles in the text for each section of the program instructions. My aim was to use a programming technique to create lines from words in order to see if I could animate Klee's desire to move between inside and outside. With the numerous shapes that could be generated from this process I was able to make associations with Klee's own ideas on nature. In other words, when 'morphed' and in motion the new geometrical shapes started to look very different from their original shapes. When morphed and moved, Klee's three original drawings *(Figs P.5.1, P.5.2, P.5.3)* offered an infinite number of new shapes. *(Figs P.5.4, P.5.5, P.5.6)*

An additional aspect of the project was to animate the movement of the transformations of these shapes. Using morphing and movement techniques the shapes started to contract and expand as if growing, or shrinking or moving. When repeated next to one another or inscribed into each other the shapes created a field, which appeared much more organic-looking than the original rigid geometry. *(Fig. P.5.7)*

My 'conversation' with Klee continued through the free associations that I started to form during the making of the project. I thought that the chosen and now morphed and animated shapes resembled flowers, leaves and butterflies. I am not sure if I was influenced to think in this way by knowing about Klee's own interest in nature but it seemed that these artificial flowers, leaves and butterflies which started their life as pure geometry had become much more

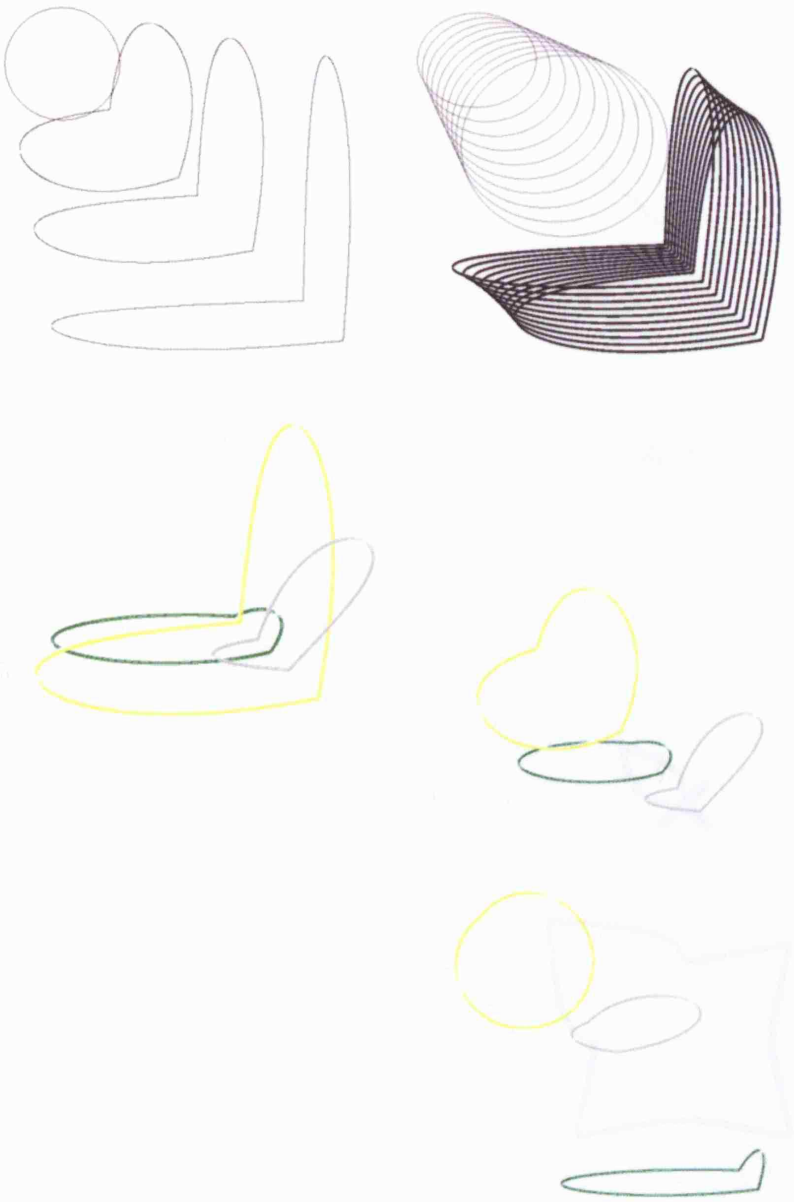

Fig. P.5.4. Ivana Wingham, *Epigrammatic Conversation with Klee on Line-endings – A Garden Project*, digital image of moving stages of a changing shape, London, 2006.

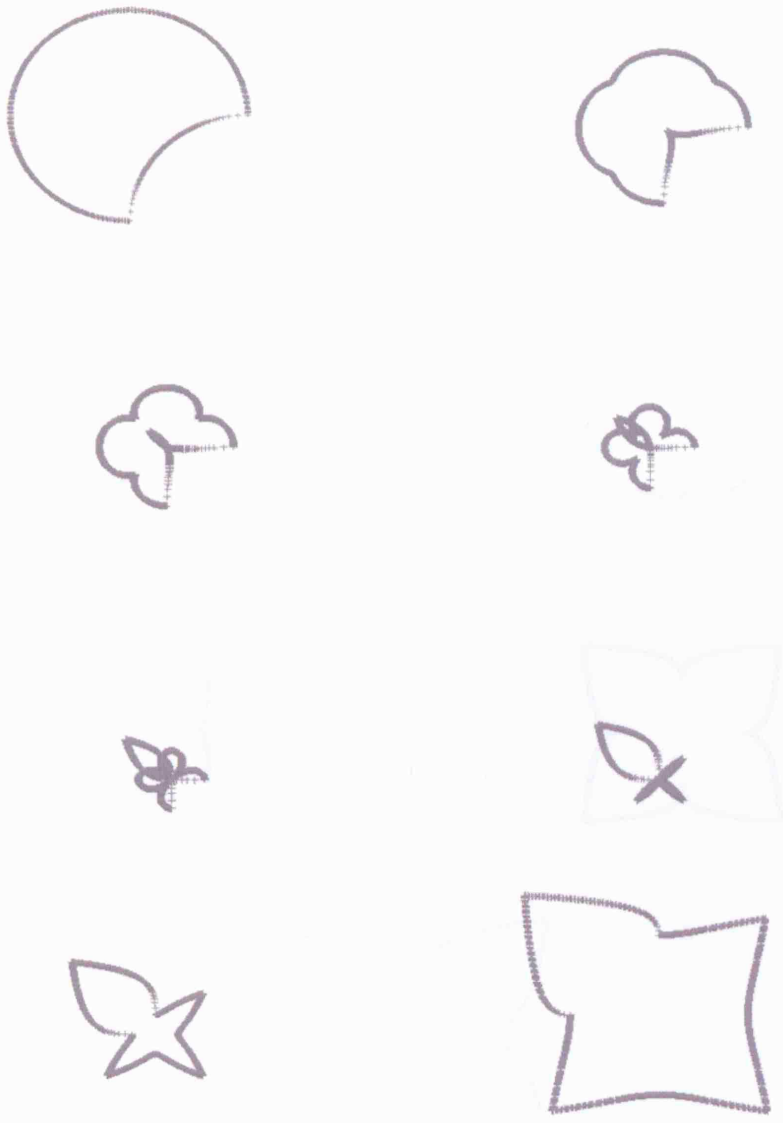

Fig. P.5.5. Ivana Wingham, *Epigrammatic Conversation with Klee on Line-endings – A Garden Project*, digital image of morphing stages of a changing shape, London, 2006.

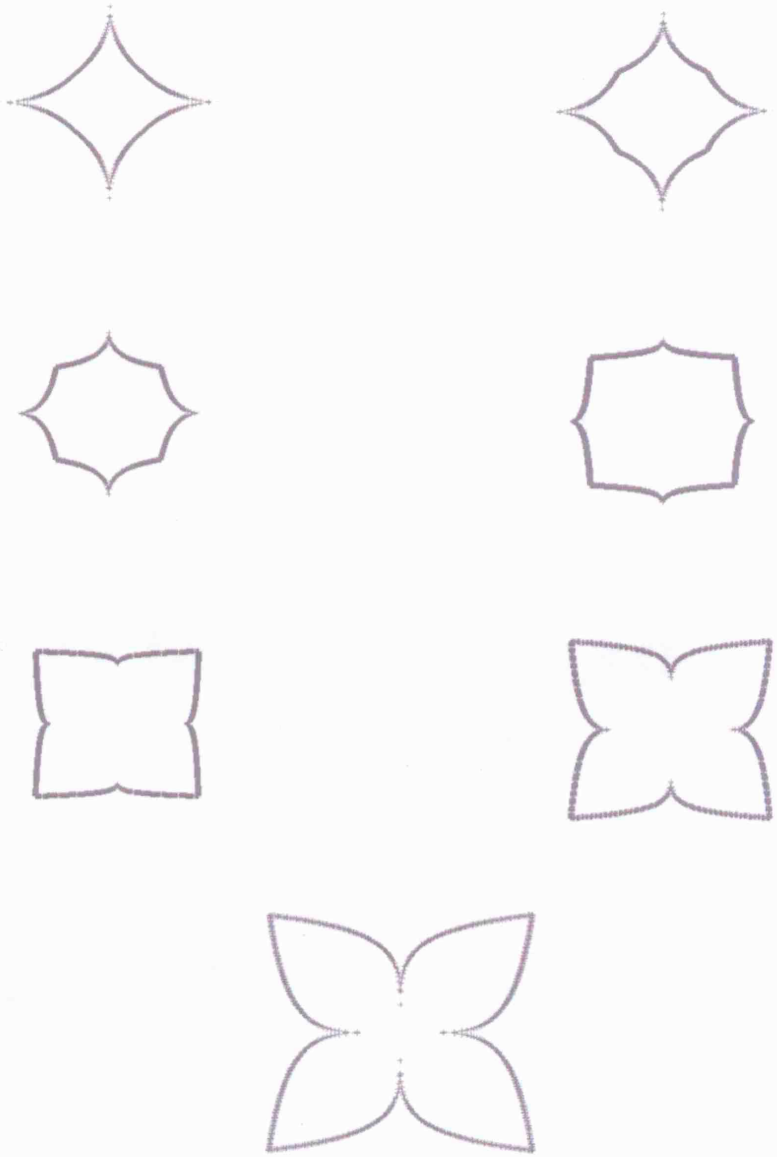

Fig. P.5.6. Ivana Wingham, *Epigrammatic Conversation with Klee on Line-endings – A Garden Project*, digital image of morphing stages of a changing shape, London, 2006.

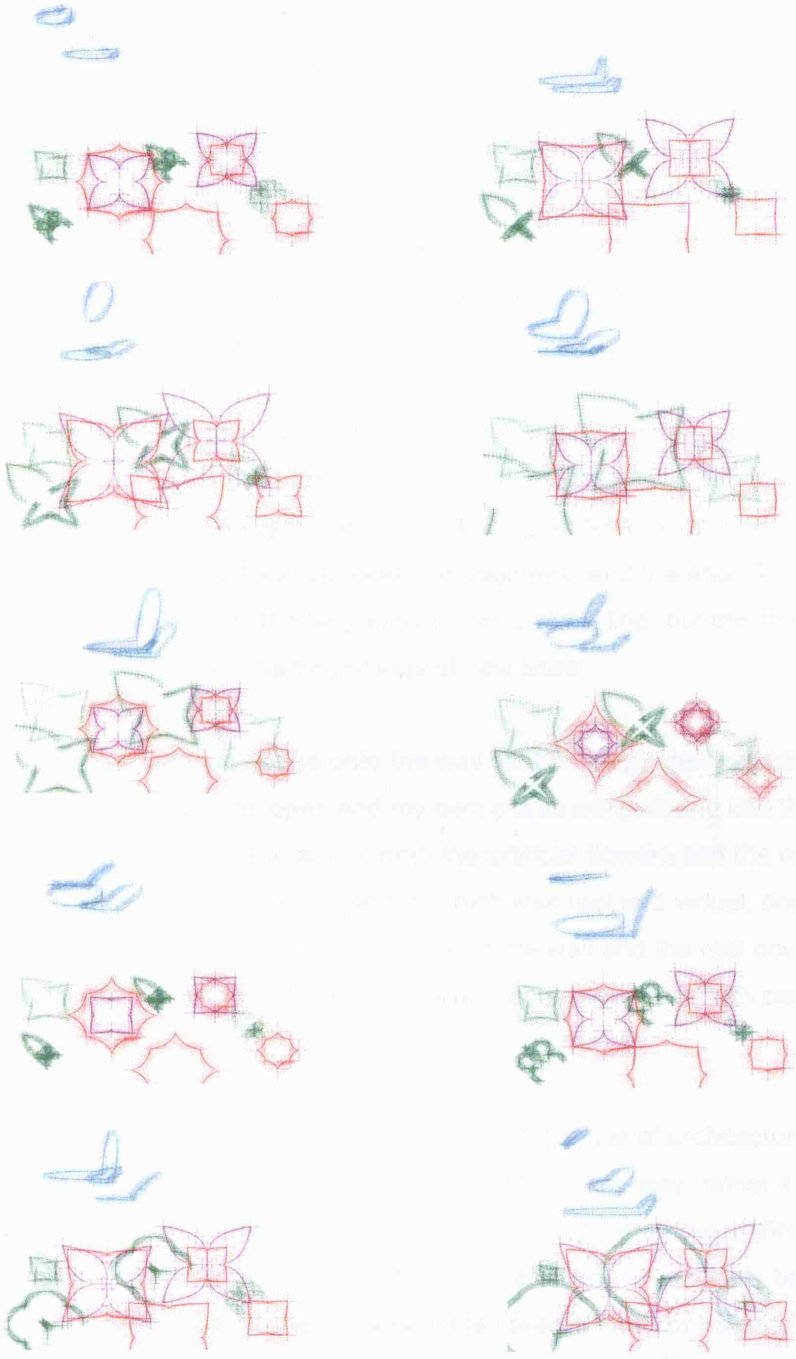

Fig. P.5.7. Ivana Wingham, *Epigrammatic Conversation with Klee on Line -endings – A Garden Project*, digital images of animation stages, London, 2006.

fluid and organic. In addition, to emphasize the growth and fragility of these shapes, the lines that outlined them were designed to resemble a constellation of dots. This made the boundary of the shapes even more delicate. The project started to remind me of the way flowers in a vase continuously change in shape. I decided to project the images on the wall of my work room, positioning a vase below the projection. I could imagine that I had a bunch of growing flowers and leaves and a few flying butterflies inside the room. *(Fig. P.5.8)*

While observing my 'vase with flowers' I realized that the project suggested something else too. Temporal in nature, the project exploited new techniques to animate static images. In a way this process reminded me of Moholy-Nagy's critique of painting, in which he suggested that film should not rely on an 'alien technique of pictoral art' but exploit the 'specific possibilities' offered by the new medium.[35]

For me the project had a two-fold role. The practice through which the project was achieved made a connection between word and image. *(Fig. P.5.9)* When completed and projected as a 'vase of flowers' the project was never fixed as an end in its own right but rather it operated in a middle ground between the beginning and the end. Similar to Klee's epigram on line-endings it was neither the beginning nor end of the line, but the moving lines operated in a middle that also provided the beginnings of new lines.

By projecting the image onto the wall next to my garden I suddenly realized something else. The garden door was open and my own plants were staring into the room. I moved my camera to capture a single image of both the artificial flowers and the natural flowers. I removed the vase. Suddenly I could see a garden which was real and virtual, one next to the other. The artificial garden was projected on the inside of the wall and the real one was just outside the wall of my work-room. *(Fig. P.5.10)* However, I could see them both clearly and at the same time.

At that moment I started to think again of the role of architecture. It was not that one garden was better than the other or more beautiful in any way, rather it was the boundary between the two that interested me – the wall that separated the artificial and the real. However in my mind the wall was obviously architectural element – not simply bricks, but rather the kind of boundary line that Catherine Ingraham has called a 'form of linearity' – here architecture may reside yet it also allows connections outside of architecture.[36]

My epigrammatic conversation with Klee on line-endings taught me something else too – that line and movement are inseparable from each other, continuously offering and opening many new ways of depicting, understanding and acting spatially. Such actions are part of the practices we may deploy in the process of creation and the lines produced by such practices

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[35] Passuth, *Moholy-Nagy*, p. 312
[36] Ingraham, *Architecture*, pp. 1-29.

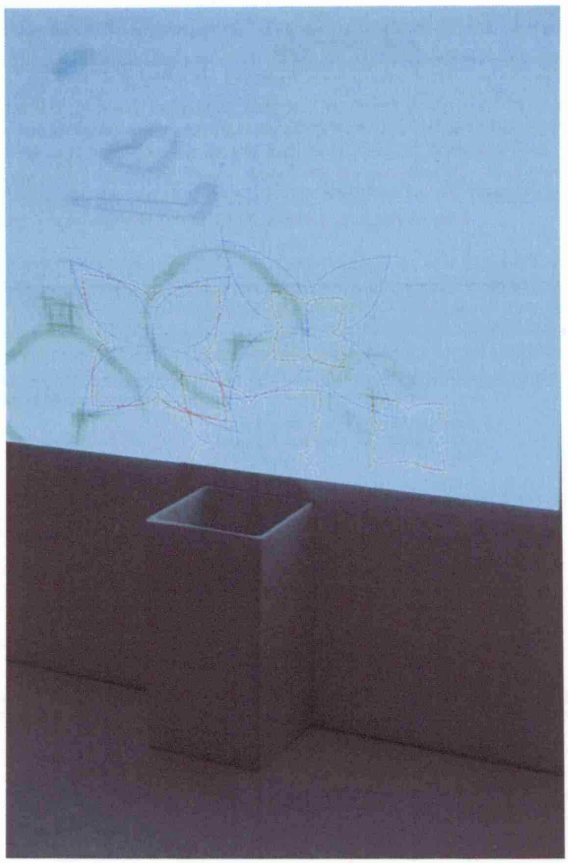

Fig. P.5.8. Ivana Wingham, *Epigrammatic Conversation with Klee on Line -endings – A Garden Project*, photograph of projected animation, London, 2006.

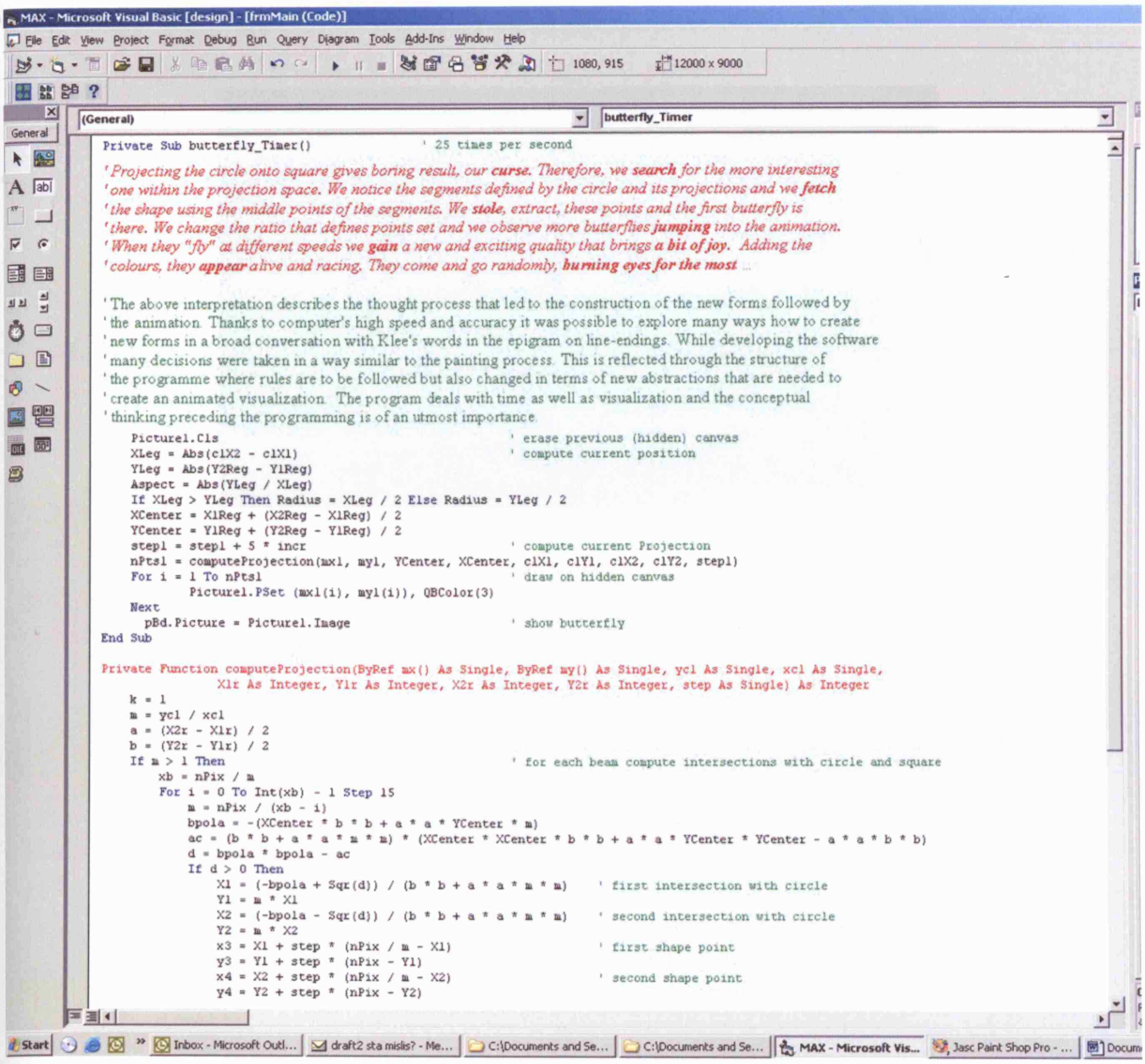


Fig. P.5.9. Ivana Wingham, *Epigrammatic Conversation with Klee on Line-endings – A Garden Project*, screen print of the digital image of the programme instructions, London, 2006.

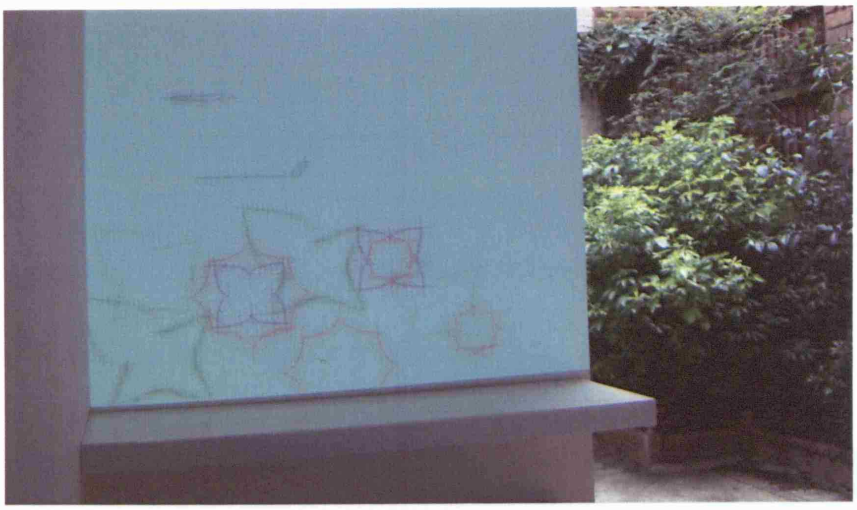

Fig. P.5.10. Ivana Wingham, *Epigrammatic Conversation with Klee on Line-endings – A Garden Project*, photograph of the 'artificial' and 'real' garden, London, 2006.

may differ. However, through new techniques and experimentation new and different clues are offered for how we may be able to create an architecture that is yet to come.

## CONCLUSIONS

I started my research with the desire to write a thesis on the line in which architectural representations could be rethought, reconsidered and reworked in the light of practices that lie outside the commonly understood boundary of architecture. My aim was to extend architectural conceptions of the line by moving outside the disciplinary boundary of architecture and between diverse, innovative and creative art and design techniques. At the closure of my investigations the line has proven to be a volatile location for understanding the convergence of various complexities pertinent to architecture. I believe that my research has demonstrated some of the many such complexities that are intrinsic to architecture, the line and the creative processes of making lines.

We have seen that a line, when 'taken for a walk', is a place where many ideas concerning the disciplinary boundaries of architecture are converged. A line, that is taken for a walk, is a mobile line or a line of mobility, and it is this idea that underlines each chapter of this thesis. I have discussed this mobility of the line with respect to four properties of the line, which I examine in turn below.

First there is the mobility of the line as a movement between visual and tactile intuitions, the movement of the hand and the eye present, which I examined in particular in Klee's diagram of creation and present in general in creative process. I also looked at the mobility of the line in terms of Klee's terms of the 'active', 'middle', 'passive' and 'mediating' line associating properties of the line with properties of the body.

Second I explored a different kind of mobility of the line when I analyzed the materiality of the line in Klee's paintings and teaching diagrams in which the properties of the line lie beyond the representational qualities demonstrated through the function of the line, the rhythm of the line and the dimension of the line. The function of the line demonstrates what a line could do, while the rhythm of the line demonstrates how the line is a part of a structure, and the dimension of the line demonstrates the relationship between the line and three-dimensional space without the use of perspective.

Third, and in relation to the immateriality of the line, examined the property of the virtual line in Moholy-Nagy's photograms as a mobile and immaterial line that forges modes of actualization through preparation and conceptual thinking rather than manual labour of producing a work of art. In discussing the anticipatory line in relation to Moholy-Nagy's photographs I focused on the presence of a line of expectation in the observer and the viewer of the work of art or particular scene. Additionally, the ambiguous line present in Moholy-Nagy's photoplastics created lines of thought beyond the picture, producing new narratives.

Fourth, the projection of the line focused on the mobile quality of the line by moving it beyond the drawn line into the space beyond. Examining Moholy-Nagy's work on theatre and film I have focused my investigations on the background of the line, the role of the line in a diagram and in a film. I have demonstrated that the line taken for a walk from a drawing into any other background surface is a line with a different materiality. By focusing on the temporal nature of film I examined the line as a temporal cut. In the diagram the mobile role of the line was presented in terms of a line of flight, a line that demonstrates the potentiality of the future that is yet to come.

This thesis has made contributions to new theoretical and practical understandings of the line in these four ways and highlights innovative uses of the line that go beyond solely representational qualities. I elaborate further on the contributions that this thesis has made in the following section, which is concerned with conceptual extensions of the line in architecture.

**TRAJECTORIES OF THE LINE**

I have argued that we should understand that a line possesses conceptual mobility. In order to do this I have drawn on Catherine Ingraham's ideas of architecture's burdens of linearity. She proposes that there is a line between architecture and other disciplines, and that these other disciplines act as supporting structures of architecture but at the same time they create fissures and fault-lines in what is usually taken as a unified architectural edifice. For these reasons Ingraham see architecture's relationship with these other disciplines as burdensome for architecture. Ingraham moves along these burdens of linearity by investigating the influences that literature, theatre, indigenous art, mathematics, urbanism and geometry have on architecture.

I extended Ingraham's idea of conceptual mobility further by focusing on the way that the line – material or immaterial – can be the driving force for the movement of concepts between disciplines. In my mind, this movement is a line, a vector of change, and a mobile trajectory that transgresses the traditional disciplinary boundaries of architecture. I was particularly interested to draw from and extend further Ingraham's concern with the conceptual mobility between architecture and literature. Her ideas, stemming from her examination of the play *King Lear*, that we can imagine an invisible map for the division of land depending on the scale of each daughter's love for their father, underpinned my commitment to look at the line beyond its representational properties. Arguing that we should look how the possession of space by the body exemplified in Stendhal's drawing/writing sketches inspired me, and so I started to look at how lines could be practised through the body. In the examples I chose to look at – Paul Klee's teaching diagrams in which the line is active, passive or mediating between two conditions – I located sites for the exploration of body and the line.

Ingraham in her research into linearity questioned the purely geometric outline of the building looking instead 'outside the material, or bodily, play of parts'.[1] She questions how *lineaments* – geometrical lines which she defines in relation to Alberti's idea that architecture is an act of conceptualizing a building – 'can be said to be out of play in the materiality they engender'.[2] One such materiality is the body and the bodily play of parts. I have extended this separation between the body and the line by addressing the line in terms of the mobility of the body. Using Grosz's ideas for locating subjectivity in the body, and its role as a pivot on which decisions and experiences hinge, I have argued that the line may possess similar properties to the body.

In **Chapter 2.0: The Mobility of the Line** I explored in detail how Paul Klee's lines possess this mobility and how we can understand such mobility through Grosz's theorizing of the body. Klee's active, middle and passive lines bring the concerns of the body to the line: a line can walk, one can make appointments along the walk, take a direct route or a wandering one. I extended Klee's own diagrams of line creation in relation to Grosz's ideas concerning the 'indeterminable position of the body' that hovers 'perilously and undecidably at the pivotal point of binary pairs'.[3] I analysed Klee's positioning of the body at the centre of his notion of optical and non-optical experience. Klee's concern was with 'shifting viewpoints',[4] in which his consideration of a mobile observer in the world of experience formed his ideas of 'subjective theory of space'.[5] This subjectivity, for Klee, was only possible once by deviating from perspective and allowing the mobility of the eye to guide us through the world of experience.

Another type of mobility I explored concerned the mobility between the eye and the hand, which occurs during the creative process of making lines. I focused my argument on Deleuze's discussion of the 'optical' and the 'haptic' in relation to painting, [6] and argued that in the creative process of making lines there is a particular movement between vision and tactile intuition. Deleuze mainly discusses four stages of the exchange that occurs between the hand and the eye in the process of painting: the digital, the tactile, the manual proper, and the haptic.[7] Using Deleuze's idea of 'sensing' and 'the sensed',[8] I focused on Klee's diagram of creation and argued in relation to Klee's 'optical' and 'non-optical' [9] influences on the artist, that the exchange between eye and hand is a movement that not only involves the 'optical' and the 'haptic' but also involves the world around us and our experiences of events and images. All are inspirations for the creative act.

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[1] Ingraham, *Architecture*, p. 59.
[2] Ingraham, *Architecture*, p. 59.
[3] Grosz, *Volatile Bodies*, pp. 23-4.
[4] Klee, 'The horizontal', p. 142.
[5] Klee, 'The horizontal', pp. 141-2.
[6] Deleuze, *Francis Bacon*, pp. 154-5.
[7] Deleuze, *Francis Bacon*, pp. 154-5.
[8] Deleuze, *Francis Bacon*, p. 34.
[9] Paul Klee, '"I" – "YOU" – "EARTH" – "COSMOS"' (trans. by author from original text in the diagram '"ICH" – "DU" – "ERDE" – "WELT"'), *Paul Klee Notebooks, Volume 1, The Thinking Eye*, Jurg Spiller (ed.), Ralph Manhaim (trans.), (London: Lund Humphries; New York: George Wittenborn, 1961), p. 67.

In **Chapter 3.0: The Materiality of the Line** I argued parallels can be drawn between Klee's ideas concerning the function, rhythm and dimension of the line and natural or bodily structures and artificial structures, where the structures of the body and nature may be recognized in artificial structures. These structures for Klee involved rhythm, time, action and force. Using Deleuze's concept that 'a force is "active"'[10] and Grosz's ideas that the making of things involves 'the integration and unification of the most minute relations of matter so they exist only by touching and interpenetrating',[11] I suggest that bodily forces and actions constitute the line's mobility in terms of function, rhythm and dimension which are all aspects of the line's materiality.

In the thesis I have argued that the mobility of the line may arise out of technique and medium. In **Chapter 4.0: The Immateriality of the Line** I focused on Laszlo Moholy-Nagy's examples of creative practice and his idea that architecture should concern 'spatial relationships' [12] rather than building material. I looked at Moholy-Nagy's practices that developed the photogram, photograph and photoplastic, and located in them immaterial properties of the line. In the section on the photogram I referred Grosz's discussion of how the actual diverges through the virtual 'forging modes of actualization that will transform this virtual into others unforeseen by or uncontained within it'.[13] I argued that the photogram is a result of the actualization of the virtual – light – into an actual, yet unforeseen, material outcome – the line. Moholy-Nagy worked with the least material matter of all – light. I observed that in the photogram it is no longer the hand that makes the line, but in Moholy-Nagy's words 'light does the work' [14] and as such the line is a form of virtuality. Even if light can be considered a form of matter and the photogram itself thought of as a material outcome I suggest that the line is a form of virtuality as it allows for the actualization of the virtual to take place – this occurs when light makes a mark on photosensitive paper. Moholy-Nagy's work on the photogram displays an immaterial way of working in the sense that the technique was concerned with the intellectual preparation of capturing the most immaterial matter – light.

I traced another aspect of the mobility of the line in Moholy-Nagy's work on photoplastics. Here I discussed how the immateriality of the line in these works was concerned with the line's associative properties that allow a picture to be interpreted in ways, which locate it beyond its visual and representational boundaries. Created in a way similar to the photomontages, the photoplastics consisted of cut-out photographs and drawn lines. I argued that these drawn lines suggest a narrative, which resides beyond their representational quality.

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[10] Cliff Stagoll, 'Force', *The Deleuze Dictionary*, Adrian Parr (ed.), (Edinburgh: Edinburgh University Press, 2005), p. 107.
[11] Elizabeth Grosz, *Architecture from the Outside: Essays on Virtual and Real Space*, (Cambridge, Massachusetts; London, England: The MIT Press, 2001), p. 179.
[12] Moholy-Nagy, *The New Vision*, p. 62.
[13] Grosz, *Architecture from the Outside*, p. 130.
[14] Rainer K. Wick quotes from Andreas Haus *MN : Fotos and Fotogramme*. See Wick, *Teaching at the Bauhaus*, p. 134.

This is achieved by connecting unusual photographic cut-outs to one another and creating in an observer's mind associations beyond those immediately seen. In addition I have suggested that the title lines of these photoplastics, often humorous or satirical, displayed aspects both of the author's subjective and critical understanding of society around us. The titles of these photoplastics, for me, form then another immaterial line, a line that is concerned with ideas, concepts and thought processes. As such the titles seem to further dissolve the representation of the image by taking the trajectories of thought outwards, making unforeseen associations.

The immateriality of the line in Moholy-Nagy's work has many resonances in later examples of artistic work concerned with conceptual aspects of art. His 'Telephone Pictures' suggest that it is not the material execution but the immaterial idea that can be a source of art production and that the production of art can be achieved even through telephone communication. Rendell outlines how the importance of immaterial ideas and concepts 'defined the early tenets of conceptualism' [15] and questions the importance placed on the role of the medium in producing art, suggesting that other immaterial mediums may produce art.[16]

The mobility of the line is also concerned with moving the line from its traditionally understood background – paper. In my **Chapter 5.0: The Projection of the Line** I developed Mark Wigley's idea in a drawing that paper is somehow not quite present, 'as if it occupies a liminal space between material and immaterial' which in turn 'allows it to act as a bridge across the classical divide between material and idea'[17] I saw a possibility here for moving the line onto a different background and suggested it is possible to use a projection screen as a background. I argued that Moholy-Nagy's experimental work in theatre and film and their relationship to projection and the background offer a different kind of understanding of drawing and projection. Projection provides a technique in which a moving drawing can be achieved on any background surface. This in turn allows the drawing to be transformed into a three-dimensional space that may be physically experienced. The drawing, taken from paper into space, can be in this way inhabited.

Throughout the thesis I have argued that the projected and mobile line assumes a new status. Referring to Deleuze's ideas concerning 'the absolute identity of the image and movement'[18], and his argument that 'the identity of the image and movement stems from the identity of matter and light' and that 'the image is movement, just as matter is light',[19] I assert that the line can be thought of as equivalent to such an image. Referencing Deleuze's

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[15] Jane Rendell, quoting Sol Le Witt's 'Paragraphs on Conceptual Art' published in Art Forum, Summer, 1967, 'between two', *The Journal of Architecture*, Volume 8, Summer 2003, p. 227.
[16] Rendell, 'between two', pp. 221-38.
[17] Mark Wigley, 'Paper, Scissors, Blur', *The Activist Drawing: Retracing Situationist Architectures from Constant's New Babylon to beyond*, Catherine de Zegher and Mark Wigley (eds), (New York: The Drawing Center; Cambridge, Massachusetts; London: The MIT Press, 2001), p. 29.
[18] Gilles Deleuze, *Cinema 1: the movement-image*, Hugh Tomlinson and Barbara Habberjam (trans.), (London: The Athlone Press, 1986), p. 61.
[19] Deleuze, *Cinema 1,* p. 62.

suggestion that 'the plane of matter is: a set of movement images; a collection of lines or figures of light; a series of blocs of space-time',[20] I have explored how a line projected onto any background locates the observer/creator within the space of the projection, rather than locating projection within the mind of the observer/creator. In this sense projecting the line onto a screen changes the nature of projection, or at least the way it has been put forward by Robin Evans who argued that projection lay in the mind of the observer/creator and that through 'guises of projection' a transference from drawing to building occurs in architectural design. In relation to Evans' argument I suggested that there might be another land of projection that lies outside of the observer/creator. Evans' argument that 'design is action at distance' where the 'gaps' between a drawing and a building are filled with 'guises of projection',[21] I extended further, taking 'design as now' in which the observer/creator is an active participant making and experiencing the design.

In the thesis I have also argued that the line in a diagram possesses a particular kind of mobility connected to the future. Taking the example of Moholy-Nagy's drawing 'Score Sketch' I have drawn on Andrew Benjamin's ideas about the diagram, which in his opinion, 'operates both prior to icons and prior to symbols' presupposing 'the possibility of their eventuality'.[22] Benjamin further outlines how the future can be suggested in a diagram: 'in the diagram there is a possibility of realizing that which is yet to come'.[23] With this idea of futurity, this something that is 'yet to come', for Benjamin 'the notion of final form vanishes'.[24] For Benjamin, the diagram offers 'potentiality' and this is evident in his demand that the diagram be used not 'to think volume, but to think spatial relations and programmatic considerations'.[25] I have argued that the immaterial lines in Moholy-Nagy's 'Score Sketch' – the absent lines of horizontality which are to synthesize the diagrammatic columns – open up exactly this land of potentiality, one which allows this drawing to be seen as an operative diagram.

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[20] Deleuze, *Cinema 1*, p. 63.
[21] Evans, *The Projective Cast*, p. xxxi.
[22] Benjamin, 'On Diagram'.
[23] Benjamin, 'On Diagram'.
[24] Benjamin, 'On Diagram'.
[25] Benjamin, 'On Diagram'.

**LOOSENING THE DIAGRAM**

The wider contribution that this thesis aims to make is to emphasise how the mobility of the line can become a major feature of the way that we look at the process of architectural design. I would like now to focus on Evans' diagram, *Projection and Its Analogues: The Arrested Image* (see *Fig.1.3)* and look at the relationship between the observer/creator designed object, perspective image and orthographic projection in the diagram. Evans clearly distinguishes three separate lines that connect the observer/creator with the areas that influence the design process – designed object, perspective image and orthographic projection. I see Evans' 'perspective image' as a particular representation of architecture, the 'designed object' as architecture and 'orthographic projection' as one of the forms of drawings available to architecture. I share Deleuze's assertion that 'there is no longer a tripartite division between a field of reality (the world), a field of representation (the book), and the field of subjectivity (the author)' and his suggestion that there is 'rather an arrangement [that] connects together certain multiplicities caught up in each of these orders'.[26] I find it difficult to separate the world, the representations of the world and my subjectivity as observer/creator in the structured way suggested by Evans' four sites and three lines. My investigations concerning the mobility of the line have greatly complicated the side of the diagram that deals with experience. For example, if we consider the line's ability to move between disciplines, where would these other disciplines lie in the diagram? Again if we consider the line's ability to move between vision and tactile intuitions in a creative process, how are we to understand Evans' description of imagination and perception as representations? If we are to understand how a line can move from one background to another, what relationships may connect the observer/creator with Evans' three main focuses of design – the designed object, representation and the drawing?

To answer some of these questions I would like to return to Rendell's discussion of walking. For Rendell, walking can be understood as 'relating one place or site to another in a particular sequence' and providing a way of 'practising space through time and time through space'.[27] She also suggests that walking is 'a critical spatial practice' which operates by 'rethinking place as unfixed and site as performed'.[28] Finally, Rendell proposes that 'as an activity, walking temporarily positions the subject in motion between a series of scenes' that may provide 'constellations in which thinking stops or allegorical and/or montage compositions form'.[29]

Rendell's first definition of walking reminds me of the creative act involved in the process of a particular drawing production. One may make drawings while walking, for example, using a stick and making marks on the sand while walking on the beach between one beach-hut

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[26] Deleuze, *On the Line*, p. 52.
[27] Rendell, *Art and Architecture*, p. 187.
[28] Rendell, *Art and Architecture*, p. 187.
[29] Rendell, *Art and Architecture*, p. 187-8.

and another. In Rendell's second definition she suggests that in order to critically practise space we need to think place as unfixed and site as performed. If we take the site of architectural drawing not to be fixed on paper but on any other surface and consider that drawing not only as an orthographic projection but a site of performance, than performing a drawing on a site outside the paper involves a simultaneity of drawing, representation and experience. Finally, Rendell suggests that as an activity walking may impinge on subjectivity in such a way that the observer/creator may experience the world in terms of series of scenes or images. This suggestion interrelates the world of experience and world of representations through observer/creator's own subjectivity.

These ideas of walking and the interconnectedness they stress between actual objects, representations and experience made me rethink the three separate lines in Evans' diagram. Drawing on ideas concerning the conceptual mobility of the line, the technical mobility of the line, and the line's ability to move between background surfaces, and thinking of the line in terms of bodily properties I started to envisage Evans' diagram from the point of view of the observer/creator in a less structured way. For me, the lines stemming from the observer/creator demanded certain fluidity.

Since I have been interested in the creative process I also started to consider what kind of mobility happens between the perceptions of the observer/creator and why are they drawn in Evans' diagram as circles lying behind the observer/creator. Again I thought of Deleuze's suggestion that 'purely actual objects do not exist' and that 'every actual surrounds itself with the cloud of virtual images'.[30] This 'cloud', for Deleuze, 'is composed of a series of more or less extensive coexisting circuits, along which the virtual images are distributed, and around which they run'.[31] For Deleuze, 'these virtuals vary in kind as well as in their degree of proximity from the actual particles by which they are both emitted and absorbed'.[32] For Deleuze, that which affects perception and makes it look like a 'particle' is this 'dynamics' in which 'an actual perception surrounds itself with the cloud of virtual images, distributed on increasingly remote, increasingly large, moving circuits, which both make and unmake each other'.[33] Deleuze's ideas on perception also made me rethink Evans' representation of the observer/creator's perceptive qualities in the diagram in terms of looser, more circuit-like clouds of particles and lines.

With these ideas in mind I started to see how Evans' diagram could be loosened so that the observer/creator became the main pivot for these new and more fluid lines. I saw these lines to be like ropes falling on the ground, loose trajectories along which relationships between the observer/creator and architecture, representations and drawings is one of mobility along these

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[30] Gilles Deleuze, 'The Actual and the Virtual', trans. by Eliot Ross Albert, Gilles Deleuze and Claire Parnet *Dialogues II*, Hugh Tomlinson and Barbara Habberjam (trans.), (London and New York: Continuum, 2006), pp. 112-5, 112.
[31] Deleuze, 'The Actual and the Virtual', p. 112.
[32] Deleuze, 'The Actual and the Virtual', p. 112.
[33] Deleuze, 'The Actual and the Virtual', p. 112.

trajectories. I also started to see particles of perception as a cloud around the observer. Although cloud-like, the intuitive, imaginary and perceptive particles in the creative design process travel along the lines creating invisible traces of these travelling trajectories. I thought that by loosening up the lines in the diagram, I could suggest the possibility of introducing all of the extended conceptions of the line, in terms of its various forms of mobility, that I have been working on. I also thought that the loosening of the lines of diagram suggested how other disciplines could be part of the architectural design process and that these new creative design processes could bring to architecture new possibilities. *(Fig. 1.3A)*

Although I have not analysed the other side of Evans' diagram – the geometrical relationships between the orthographic drawing, perspective image and the designed object – but was mainly concerned with the observer's/creator's side of the diagram, I feel that due to my analysis of the creative process the whole diagram loosens up. Considering that Evans's research was been done at a time before the rapid development of computer techniques in architectural drawings and the fact that at present the drawings for the production of buildings do not necessarily need to be orthographic projections of plans, sections and elevations but may be three dimensional drawings of building components directly passed to the contractor for the execution of the building, the geometrical relationships between drawing, perspective image and designed object I think need to be much looser than proposed in Evans' diagram.

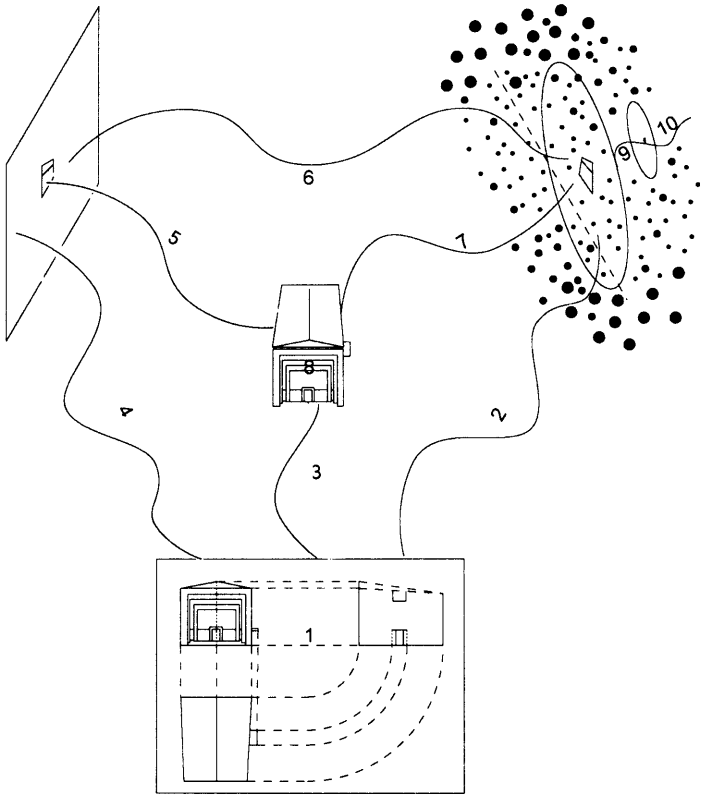


Fig. 1.3A. Ivana Wingham, *Loosening the Diagram – Projection and its Analogues: The Arrested Image*, London 2006.

## AN UNFINISHED CONVERSATION

I mentioned at the beginning of my research that architecture is a discipline that is concerned with thinking, creating, negotiating and demonstrating new spatial relationships. I also suggested that architecture, in the process of finding new spatial relationships, cannot remain within the boundaries of its own discipline but continuously engages with conditions that lie outside of it. For me this produces a dialogue between art and architecture from which the trajectories of thought on spatial relationships can be further explored. By exploring different conceptions of the line both through theory and practice I hope to have demonstrated that the power of architecture lies in its ability to engage with other disciplines and artistic practices in particular, and that at the heart of this engagement lays the line's mobility. The discipline of architecture could explore art practices that use the line as one of its main tools for defining spatial relationships.

To summarize then, the contributions that this thesis makes demonstrate a multiplicity of benefits in terms of new research into the line in architecture and the development of new practices, for making lines. Such practices extend the boundaries of architecture suggesting an interdisciplinary way of working with the line. By locating the line in interdisciplinary contemporary practices the work in this thesis could inform new research on particular interpretations of the line in drawings, space and architecture. By deploying the methods developed in this thesis through close readings of particular practices, the theoretical work in this thesis could also further the development of innovative theories on the line, as well as criticism on architectural and artistic practices. Finally, and perhaps most importantly, the insights of the thesis might be used to innovate teaching practices on the line in schools of architecture, and across art and design.

For me the most important insight to be gained from this thesis in 'taking a line for a walk' has been the possibility of understanding the development of the relationship between theoretical research and my own practice work in terms of a 'conversation'. The theory-led and the practice-led research run parallel sharing common themes but different methods. For this reason the research in this thesis remains for me an unfinished conversation. I feel that there are more trajectories stemming from my research on the line that I would like to explore further. Since in my analysis of the line I managed to do no more than to loosen Evans's diagram, one of the trajectories I would like to follow in more detail in the future is a further theoretical critique and analysis of Evans's diagram from the point of view of the designed object, a term or position which I would like to see described by what Rendell calls 'critical spatial practice' and what I would like to call 'practising space'.[34] Here I intend to extend my research on the line into the

[34] Rendell, 'between two', pp. 221-238.

contemporary interdisciplinary practice of those such as Ilya and Emilia Kabakov, Diane Cooper, Diller and Scofidio, West 8, Do-Ho Suh, Jennifer Steinkamp, Jenny Holzer and many others.

Another trajectory that I would like to explore further through my own practice is a project that embodies the critical space of architecture and operates on a boundary between the material and immaterial properties of the line where the mobility of the line acts as ambivalent and conversational in nature. Such a project would attempt to spatialize Moholy-Nagy's 'Score Sketch' diagram through practice-led research that would extend the line's properties through the performative role of architecture.

Throughout this thesis I had one idea in mind that sustained my effort to explore the line both through theory and practice – a desire to learn and discover through both theoretical and practical research new ways of working with the line which could bring about different, and for me previously un-thought, ideas for an architecture that is yet to come. The line, so far, has proved to be a mobile trajectory, and for this reason, I believe that my research on the line is an unfinished conversation. In my practice I followed a mobile trajectory, making a line between different projects and techniques of working with the line. This idea of an unfinished conversation is explored further in the final project of Part II of this thesis. Here I described how in my own practice I attempted to 'walk' the line through different concepts by using different material and immaterial techniques. Each of the projects described in Part II aim to hold a 'conversation' with an idea present in one of the previous theoretical chapters of Part I. I have argued that this is a conversation between theory and practice, or what I call a 'conversation', in keeping with Rendell's development of the relationship between theory and practice through 'relay', an idea that she takes from Deleuze, and explores through 'walking'.[35] For me this kind of 'conversation' is unfinished and will be developed through my own future research, both theoretical and practice-led.

[35] Rendell, Art and Architecture: A Place Between, (forthcoming 2006).

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